Conditions and Trends in Hog-Pork Production and Marketing: Marketing Systems and Farm Prices

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Abstract
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Disciplines
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by

Ronald Raikes, George W. Ladd and J. Marvin Skadberg

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SUMMARY

During this century three major trends have characterized the development of the hog slaughter-processing industry in Iowa and in other parts of the nation: Slaughter plants have moved from terminal market locations to hog production areas, new firms have entered the slaughtering industry, reducing the relative importance of the once dominant big five meat packing firms, and multispecies slaughtering plants have been replaced by plants specializing in the slaughter of a single species of livestock. Of the 23 federally inspected plants in Iowa that slaughtered hogs in 1972, 15 specialized in hog slaughtering and processing. About 25 percent of the hogs slaughtered in the U.S. are slaughtered in Iowa. Profit rates in the slaughtering industry are low relative to other food processing industries, and vary directly with the volume of livestock slaughtered.

Accompanying the trends in the slaughtering industry has been a trend toward direct marketing of hogs. At the beginning of the century nearly all slaughter hogs produced in Iowa moved through terminal markets. Now, less than 20 percent move through this channel, and about 75 percent move through one of five direct marketing channels—interior packing plants, packer-operated buying stations, independent buying stations and dealers, cooperative buying stations, and collection points. Less than 10 percent of the hogs produced in Iowa are marketed through auctions. Considering all types of hog market outlets, no county in Iowa has fewer than three outlets and many have more than 20.

Carcass grade and weight and live weight marketing methods are available to most Iowa producers, but more than 90 percent of the hogs produced in Iowa are marketed on a live weight basis. The main live weight methods used differ in the amount of sorting by grades and weights that is done before hogs are priced. Hogs marketed on a carcass grade and weight basis are individually weighed and graded, and this information is used to establish the price paid for each hog. The U.S. Department of Agriculture has established grades for pork carcasses and slaughter hogs that are based on the relation of carcass value per hundredweight (cwt.) to carcass weight and backfat thickness. However, no federal grading service for pork carcasses or live hogs is provided. Consequently, when hogs are marketed, packers usually grade them, and many packers use their own grading systems.

Studies indicate that carcass grade and weight prices received by producers for similar lots of hogs at different plants are nearly equal, but that live weight prices received for similar lots at different direct market outlets vary considerably. Prices paid for hogs marketed on a carcass grade and weight basis usually closely reflect the actual wholesale value of the products obtained from the hogs. However, when hogs are marketed on a live weight basis, lower quality hogs are usually overpriced and higher quality hogs are usually underpriced. Prices received by farmers are highest for hogs in the 200-220 pound weight range that are marketed in large, uniform lots.

Slaughter hog prices vary seasonally. During the 11-year period 1960-70, price changes from April to May, from May to June, from June to July, and from November to December were usually price increases. On the other hand, price changes from February to March, from March to April, from August to September, and from September to October were most often price decreases.

A futures market for live hogs was established by the Chicago Mercantile Exchange in February 1966. The trading volume on this market has increased dramatically in recent years. Through hedging, a hog producer may use the futures market to forward price his hogs and to reduce price risk. However, two limitations of the live hog futures market, from the viewpoint of producers wishing to hedge, are the large number of hogs required for delivery and the difficulty in precisely estimating the net price the producer will receive through hedging.

A number of factors, including efforts to reduce marketing costs, have been responsible for a trend toward direct or decentralized hog marketing channels. But changes in the hog pricing system have not kept pace with these changes in hog marketing channels. Consequently, some producers have been dissatisfied with the way hog prices are determined. The adoption of an alternative hog marketing system may offer opportunities to overcome this difficulty.

Among the most promising alternative marketing systems are those that combine decentralized marketing channels with a centralized pricing system. Telephone auctions and the Canadian teletype hog auctions are examples of this type of marketing system. Other examples, including one that would make use of a computer, have been proposed.

Other alternatives to the present hog marketing system might involve an extensive use of contractual agreements between producers and packers, or even vertical integration. Contracts offer advantages to packers and feed companies as well as to some producers. Several types of contracts are currently used in Iowa. However, only a small percentage of slaughter hogs are now produced under contractual or vertically integrated arrangements, and a strong trend in this direction is not apparent.
INTRODUCTION*

This report is one of a series of three dealing with conditions and trends in hog and pork production, marketing, and consumption. These reports summarize and integrate information that will help those involved in hog production and marketing to understand conditions and trends under way in the hog-pork industry, and to make better management decisions.

One of the three reports will deal with efficiency and costs in hog production. Another report, *Conditions and Trends in Hog-Pork Production and Marketing: Consumption and Marketing Margins*, (15) discusses factors affecting the average farm price of slaughter hogs and the price differentials for different weights and grades of hogs.

The hog marketing system encompasses all the activities and services that are performed from the time hogs leave the farm until they are slaughtered. This report discusses the present Iowa hog marketing system; the hog slaughter industry; the marketing channels and methods available to producers; price and cost differences between channels, methods, and seasons of the year; the live hog futures market; and several alternative marketing systems and marketing practices, their advantages, and their disadvantages. The nature of the marketing system and the farmer's choice of a place and method of marketing affect not only the price he receives for his hogs, but his marketing costs, the role he plays in the price-making process, and even the control he has over his hog production enterprise.

*Conditions and Trends in Hog-Pork Production and Marketing: Marketing Systems and Farm Prices* was written by Ronald Raikes, George W. Ladd, and J. Marvin Skadberg as part of Project 1822 of the Iowa Agriculture and Home Economics Experiment Station.
Hog slaughtering involves the conversion of live hogs into carcasses and by-products. Processing, i.e., carcass breaking, boning, curing, smoking, etc., converts carcasses into fresh pork and other pork products. Processing is done in some slaughtering plants, in specialized processing plants, and in some retail warehouses and stores.

During this century the slaughter-processing industry in the United States has experienced many changes. In the early 1900's the major hog slaughtering plants were located at terminal market centers. Ownership of slaughtering plants was concentrated in the hands of the "big five," Armour, Swift, Wilson, Cudahy, and Morris. Each of these firms operated a number of plants, and nearly all these plants slaughtered two or more species (e.g., cattle, hogs, and sheep).

Since the early 1900's the slaughter-processing industry has been characterized by three major trends—decentralization, deconcentration, and specialization. A number of forces have caused these trends.

Decentralization refers to the transfer of slaughtering facilities from central markets to production areas. Hog slaughterers spearheaded the trend toward decentralization. In the early 1900's firms began closing plants located at terminal markets and opening new facilities in production areas, especially in Iowa and southern Minnesota. Since then the trend has gained momentum. Among the factors responsible were the development of the motor truck and the construction of all-weather highways. The relocation also gave packers an opportunity to modernize their facilities and, in many cases, to reduce labor and utility costs and taxes. Many producers supported the trend because they were able to reduce transportation costs and shrink losses and to avoid terminal market charges by selling directly to the packing plants. In 1950 only 40 percent of the slaughter hogs moved through terminal markets, and by 1970 this percentage had dropped to 17 percent (42).

Accompanying the trend toward decentralization in hog slaughtering and processing has been a trend toward lower concentration of ownership. In 1920 the four largest slaughtering firms accounted for 44 percent of U.S. hog slaughter. By 1950 this percentage had dropped to 41, and by 1970 to 32 (42). There has been a similar but less pronounced trend for pork processing firms. The entry of new firms as these industries have become decentralized has an important cause of this trend. Also, some of the once dominant slaughter-processing firms have used funds available for expansion to diversify into other industries. This trend has caused competition to become more intense among firms in the slaughter-processing industry. At the same time the relationship between slaughter-processors and retailers has changed. The emergence of large-volume retailers has enabled the food retailing industry to gain bargaining strength relative to slaughterers and processors. These developments have placed firms in the slaughter-processing industry in a much more competitive environment. On the other hand, slaughterers have maintained a strong bargaining position relative to producers. In 6 of the 12 leading hog producing states the largest four firms slaughter more than 90 percent of the hogs produced. In only 2 of these 12 states, Iowa and Ohio, do the largest four firms slaughter less than 50 percent of the hogs produced.

Horizontal specialization refers to limiting the number of species slaughtered in a plant. There has been a trend toward horizontal specialization in slaughtering plants; as compared to 1950 there are fewer plants that slaughter cattle, hogs, and sheep, and more that specialize in only one species. Two factors responsible for this trend are the construction of all-weather highways. The relocation also gave packers an opportunity to modernize their facilities and, in many cases, to reduce labor and utility costs and taxes. Many producers supported the trend because they were able to reduce transportation costs and shrink losses and to avoid terminal market charges by selling directly to the packing plants. In 1950 only 40 percent of the slaughter hogs moved through terminal markets, and by 1970 this percentage had dropped to 17 percent (42).

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The trends toward deconcentration and specialization have been more pronounced in cattle slaughtering than in hog slaughtering. There are two important reasons for this. First, a large proportion of beef moves from slaughterers to retailers in carcass form, while most pork is sold in the form of cuts or processed meat items. Second, since the early 1940's U.S. Department of Agriculture grades for beef have been widely used in the wholesale beef market, but there is no federal grading of pork carcasses or cuts and practically no use of federal grades in the wholesale pork market. These differences have made it relatively easier for modern specialized "kill and chill" beef slaughtering plants to locate in production areas and to compete in the wholesale beef market with established firms.

As of March 1, 1970, there were 3,196 plants slaughtering hogs in the United States. Of these, 371 were under federal inspection. Federal inspection is required of all plants that ship meat in interstate commerce, and 90 percent of the commercial hog slaughter takes place in Federally inspected plants. Most of the federally inspected plants that slaughter hogs are located at interior points, close to production areas, and many of them slaughter only hogs.

Six Corn Belt states, Iowa, Illinois, Minnesota, Ohio, Indiana, and Pennsylvania, account for more than half of
the hog slaughter in the United States. Iowa is by far the largest state in both hog production and slaughter, producing about 22 percent and slaughtering more than 25 percent of the U.S. hog supply. Figure 1 shows the location and specialization of the 23 federally inspected hog slaughtering plants located in Iowa in 1972. Fifteen of these plants specialize in hog slaughtering and processing. Illinois is the second leading state in the production and slaughter of hogs, accounting for about 10 and 6 percent, respectively, of the national totals.

Profits of slaughtering firms display these characteristics: Average profit rates are low as compared to other food and nonfood industries, and profit rates vary considerably both among types of meat packing firms and over time.

Comparing annual average profit rates on net worth for firms in meat packing and selected other food industries for the period 1966-71, one finds that retail food chains' profit rates were highest (10.60%), followed by bakeries (10.52%), dairies (10.48%), and meat packing firms (9.52%) (40, p. 21). During this period average profit rates were 11.08 percent for all food industries, and 11.35 percent for all manufacturing industries.

Substantial differences exist in average profit rates among types of meat packing firms. For the period 1947-64 specialized cattle slaughtering firms, specialized meat processors, and specialized hog slaughturers had average profits on net worth of 16.0, 13.1, and 8.4 percent, respectively. On the other hand, firms with plants slaughtering both cattle and hogs had an average profit rate of only 6.9 percent (20, ch. 7). These relative profit rates help explain the trend toward more specialized operations.

Meat packing firms experience relatively large variability over time in their profit rates. During the period 1966-71, the average year to year change in profit rates was 1.86 percent for meat packing, 1.40 percent for bakeries, 0.58 percent for dairies, and 0.35 percent for retail food chains. The relatively large variability for slaughtering firms is due to cyclical and seasonal variations in livestock slaughter and the high proportion of fixed costs in slaughtering. Modern specialized plants require a high degree of mechanization and a high capital investment per animal slaughtered. The advent of the guaranteed work week has increased the fixed costs associated with labor. This relatively large proportion of fixed costs (capital investment and labor) makes the slaughter cost per animal heavily dependent on the volume slaughtered. As volume declines, per animal slaughtering costs rise, margins decline due to competition among packers for limited livestock supplies, and profits fall. Above-average profits usually correspond with periods of large slaughter volume.

One other development in the slaughter-processing industry, packer feeding of livestock, has concerned producers. It would appear that by producing a portion of the livestock they slaughter, packers could even out costly shortages in livestock supplies. There is a considerable amount of packer feeding of cattle in some parts of the United States, although no trend is evident. However, there is practically no packer feeding of hogs and no indication that it will soon gain in importance. There is some evidence of a trend toward contractual feeding arrangements between producers and packers. This will be discussed in detail in a later section.

MARKETING CHANNELS AND MARKET OUTLETS

Marketing channels are the paths or routes through which live hogs pass as they move from the farm to the slaughter plant. A marketing channel may involve the direct shipment of hogs from the farm to the slaughter plant, or it may involve the use of one or more marketing facilities (e.g., stockyards or an auction barn).

Trends in the hog slaughter-processing industry have been paralleled by trends in hog marketing channels. As the slaughter industry decentralized, auction markets and several types of "direct" marketing arose. The latter category includes not only shipments of hogs from farms directly to packing plants, but shipments from farms through various types of local markets to packing plants as well.

The dominant trends in slaughter hog marketing channels have been growth in direct marketing and decline in terminal markets (see table 1). Most of the growth in direct marketing had taken place by 1933. Since then the trend has continued at a much slower pace. Use of auction markets has fluctuated from year to year but has no clear trend. The pattern of change in other parts of the United States is similar to the pattern of change in Iowa.

Figure 2 shows seven major marketing channels presently available to Iowa hog producers, and presents some data on their relative importance. The direct marketing category has been subdivided into five channels: direct shipments to packing plants, packer-operated buying stations, independent buying stations and dealers, cooperative buying stations (such as those operated by Interstate Producers Livestock Association), and collection points (such as those operated by the National Farmers Organization). Combinations of channels are also used. For example, an independent dealer may buy hogs at an auction and sell them to a packer.
Figure 1. Location of federally inspected hog slaughtering plants in Iowa, 1972

Legend: ■ Specialized hog slaughtering plants
□ Multiple-specie slaughtering plants

Table 1. Packer Purchases of Slaughter Hogs in Iowa by Marketing Channel

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct*</th>
<th>Terminals and auctions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>32.7</td>
<td>67.3</td>
</tr>
<tr>
<td>1933</td>
<td>70.0</td>
<td>30.0</td>
</tr>
<tr>
<td>1956</td>
<td>73.1</td>
<td>26.9</td>
</tr>
<tr>
<td>1970</td>
<td>73.8</td>
<td>26.2</td>
</tr>
</tbody>
</table>

*Includes all markets other than terminals and auctions.

Sources:

Table 2. Relative Importance of Slaughter Hog Marketing Channels in Western Iowa and Eastern Nebraska in 1954 and 1967

<table>
<thead>
<tr>
<th>Type of market</th>
<th>1954 (percent)</th>
<th>1967 (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminals</td>
<td>49.2</td>
<td>31.5</td>
</tr>
<tr>
<td>Auctions</td>
<td>10.8</td>
<td>11.3</td>
</tr>
<tr>
<td>Packing plants</td>
<td>11.3</td>
<td>11.9</td>
</tr>
<tr>
<td>Packer operated buying stations</td>
<td>23.8</td>
<td>35.5</td>
</tr>
<tr>
<td>Independent buying stations and dealers, cooperative buying stations, and collection points</td>
<td>4.9</td>
<td>9.8</td>
</tr>
</tbody>
</table>

Sources:

Data on the relative importance of marketing channels are regularly collected only for terminal markets, auctions, and the combined direct marketing category. However, more detailed information is available from studies undertaken in 1954 (18) and in 1967 (45). The results of these studies in table 2 show changes in the relative importance of various marketing channels in western Iowa and eastern Nebraska. In this region packer-owned buying stations showed the largest gain in importance during this time period and were the most important marketing channel in 1967.

A producer's choice of a marketing channel must be accompanied by the choice of a specific market outlet. Terminal market alternatives for Iowa producers include Sioux City, Webster City, Peoria, Omaha, St. Paul, Sioux Falls, St. Joseph, and East St. Louis. Locations of auction markets in Iowa are shown in fig. 3. Figure 4 shows the location of hog slaughtering plants and packer operated hog buying stations, and fig. 5 shows locations of independent and cooperative livestock buying stations, dealers, and collection points. Counting all types of market outlets, no county in Iowa has fewer than three outlets and many have more than 20.

The relative importance of a market channel or a market outlet depends on the willingness of producers to patronize that channel or outlet. The cost of marketing is one of the factors producers consider in selecting channels and outlets. Producers' efforts to choose low-cost market outlets, i.e., to reduce transportation costs, shrink losses, and eliminate terminal market charges, have been a major force behind the trend toward direct marketing. A number of other characteristics of the market outlet and of the producer also affect this choice. A study in western Iowa and eastern Nebraska (45) found that younger and larger producers tend to bypass terminals and auctions in favor of direct market outlets. A study of Corn Belt hog producers (23) indicated that the prices received, quality premiums, convenience, the length of time before payment, and the marketing methods available are among the market characteristics producers consider in choosing market outlets.

MARKETING METHODS

Many hog market outlets offer producers an opportunity to choose a marketing method. The choice may be between a "carcass" method and one or more "live
Figure 2. Iowa slaughter hog marketing channels, 1970

Figure 3. Location of livestock auction markets in Iowa, 1972

Figure 4. Location of federally inspected hog slaughtering plants and affiliated hog buying stations in Iowa, 1972

Legend: □ Hog slaughtering plants
         △ Packer-operated buying stations

Figure 5. Location of independent and cooperative livestock buying stations, dealers, and collection points in Iowa, 1972.

weight" methods, or between two or more live weight methods. With the carcass method the price is negotiated and paid on the basis of the weight and quality or grade of each carcass. With live weight methods the price is negotiated and paid on the basis of the weight of the live hog. The live weight method may involve no grading, but in many cases, hogs are sorted into subgroups according to weight or grade, or both, and a price is negotiated for each subgroup. Whether the carcass or live weight method is used, the grading system affects the amount the producer receives for his hogs. Even though it is not the only grading system used, the USDA grading system does illustrate the factors considered and procedures used in assigning grades.

U.S. Department of Agriculture Grades

The relation of value per hundred pounds (cwt.) of carcass to carcass weight and backfat thickness is the foundation of the existing U.S. Department of Agriculture grades for pork carcasses, slaughter swine and feeder pigs. The U.S. Department of Agriculture first issued grade standards for slaughter hogs in 1918 and grade standards for carcasses in 1931. Both sets of grade standards have been revised, most recently in 1968.

"Standards for grades of pork carcasses...are based on the attributes of the product that determine its value and utility. For pork, that means the quality of the lean meat and the yield of the four lean cuts—hams, loins, picnics, and Boston Butts.

"With respect to the quality of the lean, the pork standards provide two groupings—acceptable and unacceptable. Pork carcasses with unacceptable lean quality are graded U.S. Utility. Pork carcasses that have acceptable quality of lean are further grouped—by yield of lean cuts—U.S. No. 1, 2, 3, or 4. The factors affecting the yields of cuts—and, therefore defined in the standards as the basis for the numerical grades—are the fatness of the carcass and its muscling.

"A U.S. No. 1 pork carcass is expected to yield more than 53 percent of its weight in the four major lean cuts. Obviously, this is a more valuable carcass than the U.S. No. 2 which will yield between 50 and 53 percent, a No. 3 which will yield 47 to 50 percent, or a No. 4 which will yield less than 47 percent." (38, p. 3)

"...grades for slaughter hogs are correlated directly with the grades for pork carcasses. Similarly, the grades for feeder pigs also are directly correlated with the grades for slaughter hogs. Thus, a U.S. No. 1 feeder pig, for example, can develop into a U.S. No. 1 slaughter hog, which in turn should produce a U.S. No. 1 carcass." (39, p. 4)

For carcasses possessing a normal distribution of fat and a normal development of muscling for their fatness, average thickness of backfat and carcass length or weight are used in setting carcass grade standards. Figure 6 illustrates these standards for carcasses between 27 and 36 inches long weighing 120 to 255 pounds. If length and backfat indicate a different grade than weight and backfat, grade is determined by using length.

Figure 6 shows that a 165-pound carcass of typical muscling and fat distribution is graded U.S. No. 1 if average backfat thickness is 1.4 inches or less; as U.S. No. 2 if average backfat thickness is between 1.4 and 1.7 inches; as U.S. No. 3 if average backfat thickness is between 1.7 and 2.0 inches; and as U.S. No. 4 if average backfat thickness exceeds 2.0 inches. A typical 205-pound carcass, however, can have as much as 1.5 inches average backfat thickness and be U.S. No. 1.

A 1957 study (7) found that a carcass from a No. 1 hog was worth 80 cents more per cwt. than a carcass from a No. 2 hog, and that a carcass from a No. 2 hog was worth 80 cents more per cwt. than a carcass from a No. 3 hog. During July 1969 the value difference between adjacent grades of 150-pound carcasses averaged about $1.25 (38).

Thus we see that hogs with less backfat grade higher than hogs of the same weight but with more backfat, and that heavier hogs grade higher than lighter hogs with as much or more backfat. Higher grading hogs have a higher value per hundredweight of carcass to packers.

Live Weight Methods

The three major live weight marketing methods used in Iowa might be termed the "live average" method, the "live sort" method and the "adjusted live average" method.

The live average method requires no sorting or grading of individual hogs. The buyer may estimate the number of hogs in specific weight and grade categories, but the only information relayed to the seller is the average price per hundredweight bid for the entire lot. This price is then multiplied by the total live weight of the lot to arrive at the amount to be paid to the seller.

In the live sort method the buyer sorts the hogs in the lot into groups according to weight, or grade, or both. A price per hundredweight is then negotiated for each group. The buyer may use USDA live hog grades or his own grading system. A common practice is to augment the USDA grading system by dividing the No. 1 grade into several grades, and adding grades below the No. 4 grade. Some buyers use different names. For example, the buyer will not speak of No. 1 or No. 2 hogs but of 54’s or 52’s. These latter numbers are the percentages of the four primal
Figure 6. Relationship between average thickness of backfat, carcass length or weight, and grade for carcasses with muscling typical of their degree of fatness.

*An average of three measurements including the skin, made opposite the first and last ribs and the last lumbar vertebra. It also reflects adjustments, as appropriate, to compensate for variations from normal fat distribution.

*Carcass weight is based on a hot packer style carcass.

*Carcass length is measured from the anterior point of the aitch bone to the anterior edge of the first rib.

cuts, ham, loin, Boston butt, and picnic, yielded by the carcass.

The adjusted live average method is probably the most popular live weight marketing method in Iowa. It is similar to the live average method except that hogs of exceptionally high or low quality are sorted out and priced separately, either individually or in groups. Other hogs in the lot are not sorted or graded, and a single price per hundredweight is negotiated for them.

Carcass Grade and Weight Marketing

Carcass marketing of hogs is nearly always referred to as “grade and yield” marketing. However, since the two factors used to establish the value of hogs marketed on a carcass basis are carcass grade and carcass weight, a more appropriate label is “carcass grade and weight” marketing.

Carcass grade and weight marketing of hogs was introduced in the early 1950’s by Hormel Packing Company in Minnesota. During the 1950’s and 1960’s other packing firms followed this lead, so that today most major hog slaughtering firms offer carcass grade and weight marketing programs.

The percentage of slaughter hogs marketed on a carcass grade and weight basis has grown slowly as shown in tables 3 and 4. This marketing method is more popular in Iowa than in other parts of the nation.

The main difference between live weight and carcass grade and weight methods of marketing is that the latter involves evaluation of hog carcasses rather than live hogs. In all carcass grade and weight marketing programs each individual carcass is weighed, graded, and priced, and this information is reported to the producer.

Table 3. Hogs Purchased by Packers on a Carcass Grade and Weight Basis, U. S., 1964-71

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of firms</th>
<th>Number of head (000)</th>
<th>Percent of total hogs purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>324</td>
<td>1,862</td>
<td>2.1</td>
</tr>
<tr>
<td>1965</td>
<td>339</td>
<td>1,842</td>
<td>2.6</td>
</tr>
<tr>
<td>1966</td>
<td>353</td>
<td>2,166</td>
<td>3.1</td>
</tr>
<tr>
<td>1967</td>
<td>355</td>
<td>2,496</td>
<td>3.2</td>
</tr>
<tr>
<td>1968</td>
<td>395</td>
<td>3,063</td>
<td>3.8</td>
</tr>
<tr>
<td>1969</td>
<td>383</td>
<td>3,467</td>
<td>4.3</td>
</tr>
<tr>
<td>1970</td>
<td>358</td>
<td>3,884</td>
<td>4.8</td>
</tr>
<tr>
<td>1971</td>
<td>333</td>
<td>4,451</td>
<td>4.9</td>
</tr>
</tbody>
</table>


Table 4. Iowa Packer Purchases of Hogs on a Carcass Grade and Weight Basis

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of head (000)</th>
<th>Percent of total purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>1,174</td>
<td>5.9</td>
</tr>
<tr>
<td>1969</td>
<td>1,459</td>
<td>7.0</td>
</tr>
<tr>
<td>1970</td>
<td>1,743</td>
<td>8.0</td>
</tr>
</tbody>
</table>


Each hog carcass is weighed as it passes from the killing floor to the chill room or cooler. In most hog slaughtering plants the carcasses are graded at the same time they are weighed. The grading is always done by packer employees. There is no federal hog carcass grading service, so U. S. Department of Agriculture employees are not involved in the grading. Most packers use their own grading systems rather than the federal system. These packer grading systems often utilize the same carcass characteristics that are used in the federal system to assign grades, but they usually have more grades.

The pricing procedure involves the following steps. Each day the packer establishes a “base” carcass price for his base carcass grade and weight category, a set of premiums and discounts for grade, and a set of discounts for weight. From the base price quoted by a packer, a producer may receive a premium or discount for grade. He will receive no premium for weight, but may receive a discount for weight.

Using this base price and set of premiums and discounts, the packer prices each carcass individually. After a carcass is weighed and graded, the appropriate grade and weight premiums and discounts are used to adjust the base carcass price. This adjusted price is multiplied by the carcass weight to arrive at the amount paid the producer for the individual hog. This procedure is repeated for each hog in the lot, and the total paid the producer is the sum of the amounts paid for each hog.

Finally, the producer receives a report summarizing the carcass grade and weight sale. A sample hypothetical report is presented in table 5. This report shows that on Jan. 15, 1973, Joe Doe sold 38 hogs to Jones Packing Company on a carcass grade and weight basis.

The lower right-hand side of table 5 shows that Jones Packing uses five different grades. Because the grade differential is 0 for grade 3 hogs (see column headed DIFF),
Table 5. Sample: Jones Packing Co.—Hog Carcass Grade and Yield Report

<table>
<thead>
<tr>
<th>NAME</th>
<th>Joe Doe</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS</td>
<td>Ames, Iowa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIVE WEIGHT RANGE</th>
<th>CARCASS WEIGHT RANGE</th>
<th>HOT CARCASS WEIGHT</th>
<th>CARCASS MEAT PRICE</th>
<th>SORT ACT. PUR. EST.</th>
</tr>
</thead>
<tbody>
<tr>
<td>180-200 UNDER</td>
<td>125-141</td>
<td>414</td>
<td>34.35</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>200-220 UNDER</td>
<td>142-157</td>
<td>3483</td>
<td>35.10</td>
<td>3 14 6 23</td>
</tr>
<tr>
<td>220-240 UNDER</td>
<td>158-172</td>
<td>1819</td>
<td>34.35</td>
<td>1 4 6 11</td>
</tr>
<tr>
<td>240-270 UNDER</td>
<td>173-196</td>
<td>182</td>
<td>33.85</td>
<td>1 1</td>
</tr>
<tr>
<td>270-300 UNDER</td>
<td>197-217</td>
<td>32.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300-up</td>
<td>218-up</td>
<td>31.35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| TOTALS: 5 20 13 38 |

<table>
<thead>
<tr>
<th>PACKING SOWS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300-UNDER</td>
<td>209-UNDER</td>
</tr>
<tr>
<td>300-330</td>
<td>210-231</td>
</tr>
<tr>
<td>330-400</td>
<td>232-284</td>
</tr>
<tr>
<td>400-up</td>
<td>285-up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GRADES:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADE: (gain or discount)</td>
<td></td>
</tr>
<tr>
<td>$22.76</td>
<td>$2073.93</td>
</tr>
<tr>
<td>GRADE &amp; YIELD VALUE:</td>
<td></td>
</tr>
<tr>
<td>$2051.17</td>
<td>$25.63</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIVE SORT:</th>
<th>AVE.</th>
<th>WEIGHT</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO.</td>
<td>38</td>
<td>210</td>
<td>8000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUCKING</td>
<td></td>
</tr>
<tr>
<td>COMM.</td>
<td></td>
</tr>
<tr>
<td>TOTAL EXPENSES</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE RECEIVED</th>
<th>DATE KILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-15-73</td>
<td>1-15-73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BASE MARKET</th>
<th>TATTOO NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.10</td>
<td>9959</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YIELD (Hot)</th>
<th>YIELD EST.</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.73</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL CARCASS WT.</th>
<th>DOLLARS (yield) PER CWT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5898</td>
<td>$2051.17 $25.63</td>
</tr>
</tbody>
</table>
we know the base carcass grade is 3. The right-hand side of table 5 shows BASE MARKET of $35.10. This is the price per hundredweight carcass for a base grade hog, i.e., a grade 3 hog, before any grade premiums or discounts or weight discounts are applied. The left-hand side shows the CARCASS MEAT PRICE for 142-157 pound carcasses to be $35.10: the base price. Hence we can see that the base grade and base weights are grade 3, 142-157 pound carcasses. Other entries under CARCASS MEAT PRICE differ from $35.10. Each entry’s difference from $35.10 represents a weight discount. Thus the weight discount is $4 per hundredweight carcass for carcasses of less than 125 pounds: $4 = $35.10 – $31.10. The entries under CARCASS MEAT PRICE are prices paid for carcasses of various weights.

The entries under SORT-ACT on the left-hand side of table 5 show the number of hogs in each weight range. The left-hand side of table 5 shows the total carcass weights of the hogs in each weight range under HOT CARCASS WEIGHT. The total carcass weight of all hogs sold was 5,898 pounds. The total value of these hogs excluding grade premiums and discounts was $2,051.17. This total value was determined by multiplying each CARCASS MEAT PRICE by HOT CARCASS WEIGHT and adding the results.

After obtaining values excluding grade premiums, carcass values are adjusted for grade. The entries under the columns headed 1, 2, 3, 4, and 5 on the left-hand side of table 5 show the number of hogs in each grade and weight class. The column headed DIFF in the lower right-hand side of table 5 shows grade premiums being paid by Jones Packing Company on Jan. 15, 1973. Multiplying the premium or discount by the carcass weight in hundredweights yields the value of the grade premium shown under AMOUNT. The sum of the figures listed under AMOUNT is the GRADE: GAIN OR DISCOUNT, which in this case is $22.76. Dividing $22.76 by total live weight shows the grade gain to be $0.29 per hundredweight of live weight. Total payment to Joe Doe for his hogs is $2,073.93, the sum of value excluding grade premiums ($2,051.17) and grade gain ($22.76). See the lower right-hand corner of table 5.

Although no live weight price is used in determining payment to the farmer when hogs are sold on carcass grade and weight, the lower right-hand corner of table 5 converts carcass value to average live weight price; dividing total value of $2,073.93 by total live weight of 8,000 pounds yields an average live weight price of $259.2.

In this example a No. 3 hog is the base hog. But the report does not show the packer’s specifications for a No. 3 hog, nor for any other grade of hog.

Some packers report the base market price differently than is shown in table 5. Instead of a base carcass weight price (under BASE MARKET in table 5), a base live weight price and a “standard yield” are shown in the report. For example, the Smith Packing Company may offer a base live weight price of $24.85 per cwt. with a standard yield of 71.2 percent. To compare the Smith and Jones offers, one must convert the Smith offer to a carcass weight price. This is done by dividing the base live weight price by the standard yield: $24.85 ÷ 0.712 = $34.90. Thus, the Smith Packing Company is offering a base carcass weight price of $34.90 per cwt. as compared to the Jones offer of $35.10 per cwt.

Even though carcass grade and weight programs differ considerably, all packers are expected to follow certain regulations issued in April 1966, by the Packers and Stockyards Administration (43). These require that the packer make known to the seller, prior to purchase: (a) the expected date and place of slaughter, (b) the carcass price, (c) condemnation terms, (d) carcass trimming that is done prior to grading and weighing, (e) the specifications used in grading, and (f) any other special conditions. The packer must also maintain the identity of the seller’s livestock, grade carcasses before the close of the second day following slaughter, make settlement on the basis of hot carcass weights, and provide a true written account of the weight, grade, and price of each carcass. Producers are encouraged to report violations of these guidelines to Packers and Stockyards authorities.

In principle, then, a producer can compare the grade and weight offers of various packers. He can obtain from various packers the information (a) through (e) described in the previous paragraph and use this to compare prices for carcasses of known characteristics. To use this information to compare prices that packers will pay for his next lot of hogs is more difficult. To accomplish this he must accurately estimate the carcass grade and weight that each packer will assign his hogs, and then use (a) through (f) to determine prices.

Two advantages of the carcass grade and weight method are: (a) the producer does not need to “fill” (i.e., feed and water) his hogs immediately before sale because the amount he receives is based on the carcass weight, not the live weight, and (b) the producer is provided information about the quality of each hog which he may be able to use to improve the quality of his herd. Still, the choice between marketing methods remains a difficult one, partly because of the difficulty in comparing price offers. However, some help in this choice is provided by the studies summarized in the following section.
PRICE DIFFERENCES BETWEEN MARKET OUTLETS, METHODS OF MARKETING, AND INDIVIDUAL LOTS OF HOGS

Another report in this series, *Conditions and Trends in Hog-Pork Production and Marketing: Consumption and Marketing Margins* (15), points out that major forces affecting farm prices of hogs are the number and weight of slaughter hogs marketed; the number and weight of slaughter cattle marketed; consumer income; prices of inputs used in slaughtering, processing, and marketing; and the trend toward higher labor productivity in slaughtering, processing, and marketing. This section discusses some of the other forces that affect the price an individual producer receives for a specific lot of hogs.

In studies undertaken at Iowa State University in the early 1960's (22), (33), slaughter hogs produced on University farms were shipped to several markets, and "market-weight" prices were compared. The market-weight price is the price per hundred pounds of live weight received by the producer after all marketing costs, commission fee, yardage charge, etc., except transportation charges, have been subtracted.

One of these studies compared market-weight prices received at two terminal markets, two interior Iowa packing plants that purchased the hogs on a carcass grade and weight basis, and two packing plants that purchased the hogs on a live weight basis.

The average market-weight prices received at these outlets are shown in table 6. It was found that (1) average prices received at the two terminal markets were not significantly different, (2) average prices received at the two carcass grade and weight outlets did not differ significantly, (3) prices received at the two live weight outlets were significantly different, and (4) the grade and weight outlets returned the highest average market-weight price, followed by one of the live weight outlets, the terminal markets, and the other live weight outlet.

Table 6. Average Market-weight Hog Prices at Various Markets, 1963-64

<table>
<thead>
<tr>
<th>Markets</th>
<th>Market-weight price/cwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminals</td>
<td>$15.01</td>
</tr>
<tr>
<td>Grade and weight markets</td>
<td>15.55</td>
</tr>
<tr>
<td>Live sort market (1)</td>
<td>14.35</td>
</tr>
<tr>
<td>Live sort market (2)</td>
<td>15.13</td>
</tr>
</tbody>
</table>


(Data collected from August 1963 through March 1964)

A second study at Iowa State University compared prices received at four carcass grade and weight outlets. Again there were no significant differences in the average market-weight prices received. Apparently, even though the carcass grade and weight programs offered by different packers vary considerably, and are difficult to compare, the prices paid by these packers on a given day for hogs of similar quality are comparable.

The hogs marketed in these studies were above average in quality, and it may be that grade and weight marketing returns higher prices only for high-quality hogs. This possibility was examined in a study in which hogs were divided into high- and low-quality groups, and lots from each group were shipped to a terminal market, and to a packing plant that purchased the hogs on a carcass grade and weight basis. The average market-weight prices received are shown in table 7. Average market-weight prices received for the lower quality hogs were nearly the same in the two markets. However, an average premium of 56 cents per hundredweight was received for high-quality hogs at the grade and weight market, but no premium was received for high-quality hogs at the terminal market.

Table 7. Market-weight Prices Received for Low- and High-Quality Hogs, 1965

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Market-weight price/cwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-quality hogs</td>
<td>$16.72</td>
</tr>
<tr>
<td>Low-quality hogs</td>
<td>16.72</td>
</tr>
</tbody>
</table>

Grade and Weight

<table>
<thead>
<tr>
<th></th>
<th>Market-weight price/cwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-quality hogs</td>
<td>17.30</td>
</tr>
<tr>
<td>Low-quality hogs</td>
<td>16.74</td>
</tr>
</tbody>
</table>


(Data collected March 1965)

A study made in Minnesota (9) compared the pricing accuracy of live weight and carcass grade and weight marketing methods. Pricing is more accurate the more nearly prices paid for hogs reflect the actual wholesale value of the pork and pork products obtained from the hogs. In this study a group of slaughter hogs were priced using both methods. Then, the carcasses were broken into wholesale cuts, and wholesale prices were used to compute values of the carcasses and of the live animals. These values were then compared with the prices paid under the two marketing methods. This study concluded that (a) carcass grade and weight pricing is not completely accurate, but is considerably more accurate than live weight pricing and (b) in live weight marketing lower valued hogs are usually overpriced and higher valued hogs are usually underpriced.
This study and the last one of the three Iowa State studies cited suggest, then, that producers may be able to improve returns by marketing higher quality hogs on a carcass grade and weight basis and lower quality hogs on a live basis.

One other characteristic of alternative market outlets and marketing methods that has been studied is price responsiveness. If an outlet demonstrates price responsiveness, prices offered at that outlet adjust quickly to changes in general levels of hog prices. Other things being equal, it would be to the producer's advantage to market at a more responsive outlet during periods of rising prices and at a less responsive outlet during periods of declining prices. In a study at Iowa State University (34) it was found that prices were less responsive at terminal markets than at packing plants buying on either alive weight or carcass and weight basis.

Several other factors have been found to affect the price a farmer receives for an individual lot of hogs. Effects of some of these factors are summarized in a study made in Illinois in 1959-60 (3). These results are similar to those obtained in other years and locations. The study found that 200- to 220-pound hogs bring higher prices than 180- to 200-pound hogs, which in turn bring higher prices than 220- to 240-pound hogs, which in turn bring higher prices than 240- to 270-pound hogs.

The study found that the size and uniformity of the farmer's lot of hogs influences the average price he receives. A larger lot brings a higher average price, and uniform lots bring higher prices than do lots of mixed weights and grades.

The study also found that live weight prices received at direct market outlets for similar lots of hogs vary considerably. In June 1960, prices paid for 200- to 210-pound hogs by direct packer buying stations owned by the same packer and located within 40 miles of each other, varied by as much as 76 cents per cwt.

There is day-to-day variation in prices. The evidence as to whether the variation is regular, systematic, and predictable—and hence usable by a farmer in making marketing decisions—is mixed. The finding that is common to many studies of day-to-day price variations is that, if systematic day-to-day variations exist, Monday is the highest price day.

In summary, then, for a specified average level of hog prices, the price received by an individual farmer for his hogs depends upon a number of factors: grade, weight, method of pricing (live weight or carcass grade and weight), market outlet, size of lot, uniformity of lot and possibly day of week. Hog prices also vary seasonally.

### SEASONALITY

One of the causes of month-to-month or seasonal variation in prices is seasonal variation in consumer preferences, which leads to seasonal variation in consumer demand. Farm production methods are another cause of seasonal variation. Systems of two to four litters per year fit well, and profitably, into diversified farming enterprises. Operation of such systems generates seasonal variation in farm slaughter hog marketings. Between them, seasonal variations in hog marketings and seasonal variations in consumers' demand generate seasonal changes in pork consumption, in pork and hog prices, and in marketing margins. The upper right-hand corner of figure 7 shows monthly variation in retail pork prices. The lower right-hand corner shows seasonal variation in net farm value. Net farm value is the farm value of the amount of live hog required to produce 100 pounds of pork cuts at retail. Seasonal variation in net farm value is nearly identical with seasonal variation in farm price.

In each graph in fig. 7, 100 percent represents the level of production or price or price spread in the average month of the year. Each graph contains three lines. The solid line shows average seasonal variation in 1949-59; the dotted line, 1960-64; the broken line, 1965-68. The solid line in the upper left-hand corner shows that during 1949-59 pork production in January was 20 percent higher than average monthly pork production; in July pork production was nearly 20 percent below average monthly pork production. The upper left-hand graph shows that April to September is typically a period of low production and October to March is typically a period of high production. The lower right-hand corner shows that June to September is typically a period of high net farm value (and hence of high farm prices) and November to April a period of low net farm value (and hence of low farm prices).

The three lines in each graph in fig. 7 show typical patterns of seasonal variation. Seasonal patterns do vary from year to year, as shown in table 8. For each consecutive 2-month period the first four columns in the body of table 8 show the number of times price rose between the first and the second month, the average increase, the number of times price fell, and the average decrease. The second four columns show the same four pieces of information for periods when commercial hog slaughter was trending upward. The last four show the information during periods of downtrends in commercial slaughter. In reading this table we need to be careful to distinguish seasonal patterns and trends. A seasonal rise, or a seasonal decline, lasts but a few months. For example, referring to the broken line in the upper left-hand corner of fig. 7: Pork production rises seasonally from July to October (3 months) and falls seasonally from March to July (4 months). By contrast, a trend lasts between 15 months...
Figure 7. Seasonal variation in pork production, prices and price spreads

**SEASONAL VARIATION IN PORK PRODUCTION AND PRICE SPREADS**

**PORK PRODUCTION**

- % of annual average
- Pork retail prices
- Farm-retail spread
- 1949-59
- 1965-68

**NET FARM VALUE**

- 80
- 120

**FARM-RETAIL SPREAD**

- 80
- 120

U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS 7117-69 (12)
ECONOMIC RESEARCH SERVICE
Table 8. Month-to-Month Price Movements During 1960-70. Interior Iowa and Southern Minnesota Prices for 220-240 Pound Barrows and Gilts

<table>
<thead>
<tr>
<th>Consecutive Months</th>
<th>Entire 11-year period</th>
<th>During periods of upward trends in commercial hog slaughter</th>
<th>During periods of downward trends in commercial hog slaughter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price increases</td>
<td>Price decreases</td>
<td>Price increases</td>
</tr>
<tr>
<td></td>
<td>Number</td>
<td>Av, incr. ($/cwt.)</td>
<td>Number</td>
</tr>
<tr>
<td>January-February</td>
<td>7</td>
<td>.65</td>
<td>4</td>
</tr>
<tr>
<td>February-March</td>
<td>2</td>
<td>1.21</td>
<td>9</td>
</tr>
<tr>
<td>March-April</td>
<td>3</td>
<td>.44</td>
<td>8</td>
</tr>
<tr>
<td>April-May</td>
<td>8</td>
<td>1.58</td>
<td>3</td>
</tr>
<tr>
<td>May-June</td>
<td>11</td>
<td>1.30</td>
<td>-</td>
</tr>
<tr>
<td>June-July</td>
<td>10</td>
<td>.84</td>
<td>1</td>
</tr>
<tr>
<td>July-August</td>
<td>5</td>
<td>.46</td>
<td>6</td>
</tr>
<tr>
<td>August-September</td>
<td>1</td>
<td>.07</td>
<td>10</td>
</tr>
<tr>
<td>September-October</td>
<td>2</td>
<td>.75</td>
<td>9</td>
</tr>
<tr>
<td>October-November</td>
<td>4</td>
<td>.46</td>
<td>7</td>
</tr>
<tr>
<td>November-December</td>
<td>9</td>
<td>.95</td>
<td>2</td>
</tr>
<tr>
<td>December-January</td>
<td>9</td>
<td>.51</td>
<td>2</td>
</tr>
</tbody>
</table>

and 36 months, on occasion even more. Seasonal variation compares one month with the preceding month in the same year; trend compares one month with the same month in the preceding year.

The first row of table 8, for example, shows that in 7 of the 11 years 1960 through 1970, prices rose between January and February; the average increase in these 7 years was 65 cents per hundredweight. In 4 of the 11 years, price fell between January and February; the average decrease was 35 cents per hundredweight.

During the entire 11-year period the number of price increases substantially exceeded the number of price decreases in April-May, May-June, June-July, November-December, and December-January. For these months the average increase exceeded the average decrease. The number of price decreases substantially exceeded the number of price increases in February-March, March-April, August-September, and September-October. For these months the average decrease exceeded the average increase.

Between September and October price fell more often and by larger amounts than it rose during the entire 11-year period. Between these two months, however, the number and size of price increases equaled the number and size of price decreases during periods of downward trends in commercial slaughter. But price declined between September and October every time when slaughter was trending upward. Between October and November the number and size of price decreases exceeded the number and size of price increases when slaughter was trending upward; but the number of increases exceeded the number of decreases when slaughter was trending downward.

Feeder pig prices also vary seasonally. Feeder pig prices are relatively high during the first half of the year and low during the second half. The difference between the seasonal patterns for feeder pig prices and slaughter hog prices reflects, among other things, the months required for a pig to grow from 40 pounds to slaughter hog weight.

One of the tools available to producers who wish to reduce the risk associated with seasonal and longer term price changes is the futures market.

THE LIVE HOG FUTURES MARKET

A futures market for live hogs was established in February 1966, by the Chicago Mercantile Exchange. The introduction of this market followed the introduction of a live cattle futures market a year earlier. The introduction of live hog futures trading made it possible for hog producers to use the futures market to reduce price risk and to forward price their hogs.

The trading volume grew slowly during the first few years of trading but recently has increased dramatically. Contracts are now available for seven delivery months. Each of these has shown an increase in activity since 1966. The present volume of trading in live hog futures is sufficient to provide the liquidity necessary for hedging.

The live hog futures market has one standardized contract for all delivery months. The basic 1973 contract specifications for the Mercantile Exchange's Live Hog Futures contract call for delivery of 30,000 pounds of barrows and gilts which must fall within the 200-230 pound weight group and grade USDA No. 3 or better. A limited number of USDA No. 4 hogs and hogs whose weight varies within 10 pounds from the above weight group are allowed but at a specified discount.

The contract can be delivered at designated central public markets in the following cities: Peoria, Ill.; Omaha, Neb.; Sioux City, Iowa; St. Louis, Mo.; St. Paul, Minn. and Kansas City, Mo. If the trader chooses to deliver, delivery must be made during the last seven business days of the contract month.

In 1973 contracts were available for the following months: February, April, June, July, August, October and December. Traders must pay a brokerage fee and make a margin deposit for every contract traded.

Margin deposits vary as hog prices change but usually amount to about 5 percent of the total value of the contract.

A producer places a hedge by selling one or more futures contracts for the month in which he plans to market his hogs. One contract is sufficient to hedge 130 to 150 hogs. He may place a hedge at any one of a number of times: when he buys feeder pigs, farrows pigs, weans pigs, or any time during the feeding process. The producer should lift or remove his hedge at the time he markets his hogs. He has two options in lifting his hedge: (1) he can market his hogs by delivering them in accordance with contract specifications, or (2) he can buy a futures contract for the same delivery month as the contract he sold, and sell his hogs on a cash market.

Before placing a hedge, the producer should estimate and compare the net prices he will receive with and without a hedge. Hedging will be an attractive alternative if it offers a higher expected price than not hedging. But a producer may elect to hedge even if the expected price with a hedge is lower, because hedging offers "protection" against unexpected price changes.

To estimate prices he will receive with and without hedging, the producer should work through the steps
In the example in table 9, the price expected with a hedge is slightly less than with no hedge. Even so, the producer may decide to hedge because of the price protection it affords. Examples 1 and 2 in table 10 illustrate how a hedge may return the producer the net target price for his hogs regardless of price changes during the period of the hedge. In both examples the estimated net target price of $33.90 per cwt. was obtained because the actual basis at the time the hogs are marketed is equal to the estimated effective basis ($32.85 - $32.10 = $0.75, and $35.85 - $35.10 = $0.75).

In actual hedging situations the basis usually cannot be precisely predicted. Example 3 in table 10 is a case in point. The basis at the time the hogs are marketed is $0.15 per cwt. greater than the expected basis ($35.85 - $34.95 = $0.90), and the net price received is $0.15 per cwt. less than the net target price. If the basis had been less than the estimated $0.75 per cwt. the net price received would have been higher than the net target price.

In example 4 in table 10 the actual basis at marketing time is $1.50 per cwt. This is not only greater than the estimated effective basis, but it is also greater than the total additional costs incurred in delivering on the contract (item 2, table 10). Therefore, the producer can obtain a higher net price by delivering on the contract than by offsetting his futures position and selling locally. The net price obtained through delivery, $33.65 per cwt., is the minimum price the producer should receive if he hedges: If the actual basis at marketing time is greater than delivery costs, he can receive this price by delivering hogs on the contract (example 4); if the actual basis is less than delivery costs, he can obtain a higher net price by offsetting his futures position and selling locally (examples 1 to 3).

Price risk can be reduced through hedging so long as the error in predicting the basis is less than the error in predicting actual cash prices. The more stable and predictable the basis, the more effective is hedging in reducing price risk. The basis for the interior Iowa hog market is nearly always positive, meaning that the futures price is nearly always above the interior Iowa cash price, but it is quite variable. The average interior Iowa basis for the end of each of the last 3 weeks of each contract maturing during the period February 1971 to October 1972 was $1.54 per cwt. The range in the basis for these 39 weeks was from $0.57 per cwt. to $2.50 per cwt.—nearly $2 per cwt.

Because the basis represents the difference between the cash market price and a futures contract price, one would expect the basis for each contract month to be different. Also, the basis can vary from locality to locality and from one period to another. A change in basis can result from a change in cash price and (or) a change in futures price.

Basis and basis patterns are much less useful in livestock hedging than they are in grain hedging. A large portion of the basis in most commodities is made up of storage costs. But since livestock are not stored and are produced year around, the basis does not exhibit any consistent seasonal pattern.

From the viewpoint of a producer wishing to lessen his price risk through hedging, this extreme variability in the basis must be regarded as a major limitation of the live hog futures market. The net price received through hedging may vary considerably and unpredictably from the target price estimated at the time the hedge is placed.

Another major limitation from the viewpoint of the producer concerns the specifications for delivery. Delivery requirements call for 30,000 pounds of live hogs, or from 130 to 150 hogs. And these hogs must fall in the 200- to 230-pound weight range. Most producers, even though they produce more than 130 hogs per year, do not have 130 hogs in this weight group to market on any one day. Therefore, delivery is feasible only for extremely large hog producers.

The live hog futures market can be used by producers to reduce price risk, but a hedging program should be undertaken only if the producer clearly understands futures trading and the limitations of the live hog futures contract. The reader interested in learning more about hedging livestock is referred to Skadberg and Brandsberg (34).
Table 9. Live hog futures worksheet and example

Date April 17, 1973  Month hogs are to be marketed July, 1973

I. Estimating price with a hedge

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current futures price(^a) for July (month)</td>
<td>$34.85 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Estimating the effective basis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delivery costs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transportation cost differential(^b)</td>
<td>$0.40 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Shrink cost differential(^b)</td>
<td>0.20 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Marketing cost differential(^b)</td>
<td>0.40 per cwt.</td>
</tr>
<tr>
<td>2</td>
<td>Total</td>
<td>$1.00 per cwt.</td>
</tr>
<tr>
<td>3</td>
<td>Historical basis</td>
<td>$0.75 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Expected basis at marketing date</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Effective basis (smaller of items 2 &amp; 3)</td>
<td>$0.75 per cwt.</td>
</tr>
<tr>
<td>5</td>
<td>Gross target price (item 1 minus item 4)</td>
<td>34.10 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Hedging costs and quality adjustment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brokerage fee</td>
<td>$0.10 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Interest on margin</td>
<td>0.10 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Quality adjustment</td>
<td>0 per cwt.</td>
</tr>
<tr>
<td>6</td>
<td>Total</td>
<td>$0.20 per cwt.</td>
</tr>
<tr>
<td></td>
<td>Net target price with hedge (item 5 minus item 6)(^c)</td>
<td>$33.90 per cwt.</td>
</tr>
</tbody>
</table>

II. Estimating price with no hedge

Local market price forecast for month hogs are to be marketed\(^c\) | $34.00 per cwt. |

---

\(^a\)For delivery to Peoria use quoted price; use quoted price minus 25 cents for delivery to Sioux City, Omaha, St. Louis, or St. Paul; use quoted price minus 50 cents for delivery to Kansas City.

\(^b\)Cost of marketing at delivery point used in selecting current futures price minus cost of marketing locally.

\(^c\)Subtract cost of marketing locally to obtain net price at the farm.
Table 10. Hedging Examples

Example 1. Hedging with price decline: actual basis equals estimated effective basis.

<table>
<thead>
<tr>
<th>Date</th>
<th>Futures market transactions</th>
<th>Cash market transactions</th>
</tr>
</thead>
</table>
| April 17 | Sell futures contract  
(place hedge) $34.85 | Sell hogs on local market $32.10 |
| July 2  | Buy futures contract (lift hedge) 32.86 | |
|        | Futures profit $ 2.00       | |

Hedging results

<table>
<thead>
<tr>
<th>Cash price</th>
<th>Futures profit</th>
<th>Hedging cost</th>
<th>Net price&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>$32.10</td>
<td>2.00</td>
<td>$34.10</td>
<td>$33.90</td>
</tr>
</tbody>
</table>

Example 2. Hedging with price increase: actual basis equals estimated effective basis.

<table>
<thead>
<tr>
<th>Date</th>
<th>Futures market transactions</th>
<th>Cash market transactions</th>
</tr>
</thead>
</table>
| April 17 | Sell futures contract  
(place hedge) $34.85 | Sell hogs on local market $35.10 |
| July 2  | Buy futures contract (lift hedge) 35.85 | |
|        | Futures loss $ -1.00        | |

Hedging results

<table>
<thead>
<tr>
<th>Cash price</th>
<th>Futures loss</th>
<th>Hedging cost</th>
<th>Net price&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>$35.10</td>
<td>-1.00</td>
<td>$34.10</td>
<td>$33.90</td>
</tr>
</tbody>
</table>

<sup>a</sup>Subtract local marketing costs to obtain net price at the farm.
Table 10. Hedging Examples (Continued)

Example 3. Hedging with price increase: actual basis greater than estimated effective basis.

<table>
<thead>
<tr>
<th>Date</th>
<th>Futures market transactions</th>
<th>Cash market transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 17</td>
<td>Sell futures contract (place hedge) $34.85</td>
<td>Sell hogs on local market $34.95</td>
</tr>
<tr>
<td>July 2</td>
<td>Buy futures contract (lift hedge) 35.85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Futures loss -1.00</td>
<td></td>
</tr>
</tbody>
</table>

Hedging results

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash price</td>
<td>$34.95</td>
</tr>
<tr>
<td>Futures loss</td>
<td>-1.00</td>
</tr>
<tr>
<td>Hedging cost</td>
<td>$33.95</td>
</tr>
<tr>
<td>Net price&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$33.75</td>
</tr>
</tbody>
</table>

Example 4. Hedging with price increase: actual basis greater than delivery costs.

<table>
<thead>
<tr>
<th>Date</th>
<th>Futures market transactions</th>
<th>Cash market transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 17</td>
<td>Sell futures contract (place hedge) $34.85</td>
<td>Local market price $35.00</td>
</tr>
<tr>
<td>July 2</td>
<td>Futures contract price 36.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver hogs on contract</td>
<td></td>
</tr>
</tbody>
</table>

Hedging results

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivered price</td>
<td>$34.85</td>
</tr>
<tr>
<td>Delivery costs</td>
<td>-1.00</td>
</tr>
<tr>
<td>Hedging cost</td>
<td>$33.85</td>
</tr>
<tr>
<td>Net price&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$33.65</td>
</tr>
</tbody>
</table>

<sup>a</sup>Subtract local marketing costs to obtain net price at the farm.
REDUCING COSTS OF HOG MARKETING

In a previous section entitled Organization of the Iowa Slaughter-Processing Industry, it was pointed out that rates of profit for meat packing firms are relatively low compared to rates of profit for other food marketing firms and for nonfood firms. Since 1966 meat packers' profits as a percentage of sales have ranged between 0.8 and 1.4 percent. This size and persistence suggests that the main effects of reductions in costs of marketing hogs and pork are not to increase profits but are to increase prices to producers or reduce prices to consumers. Both effects are beneficial to producers, the latter because it stimulates pork consumption.

A great deal of research has been devoted to reduction of marketing costs. Two studies examined the costs of hog marketing in Illinois (4) and Michigan (29) and ways to reduce these costs. These studies will be summarized here.

Efficiency of Country Hog Markets

The decline in the importance of terminal markets has been accompanied by a proliferation of country hog markets (packer, cooperative, and independent buying stations). Two economists at the University of Illinois studied costs of operating country hog markets, factors affecting their costs of operation, and what changes could be made to reduce these costs (4). Cost data were obtained from 18 packer buying stations and 30 cooperative and independent buying stations (order buying points). These markets were divided into four size groups. For each size group several cost items were computed to determine the effect of volume on costs. Finally, an attempt was made to determine what other factors (besides size) affect costs. Note that the cost information obtained excludes transportation, shrinkage, and some overhead costs.

The authors concluded: (a) Costs per hog declined as volume handled increased. Costs ranged from 81 cents per hog for the smallest markets to 43 cents per hog for the largest. (b) Factors having the most influence on costs per hog handled were volume handled, the rate of use of facilities (the more fully utilized, the lower the costs), and investment per hog handled (the higher the investment the higher the costs). (c) More than two-thirds of the country markets could be eliminated. Only 15 markets equal in size to the largest market in the sample were needed to handle all the hogs handled by the 48 markets. And, if there were only 15 markets, total costs of operating country markets would be reduced. (d) Many markets are operated inefficiently (have high costs) as compared to other markets in the same size category. (e) Even when overhead costs are excluded, typical commission fees do not cover operating costs. Just in order to break even, several markets would need to hire very inexpensive labor, gain income by pooling hogs, or reduce prices paid to producers. (f) Larger producers tend to avoid country markets and deal directly with packers.

Costs of Alternative Marketing Patterns

Some findings of a Michigan study (29) agree with the results of the Illinois study, but some differ. At present the principal marketing channels used by hog producers in Michigan are auctions, local markets and direct sales to packers. The objective of the Michigan study was to compare costs of marketing hogs in Michigan under the present marketing pattern and under four alternative marketing patterns. For each pattern an attempt was made to include all costs involved from the time hogs leave the farm until they are placed in holding pens at the slaughtering plant. The five alternative patterns analyzed involved various combinations of marketing agencies and various methods of buying hogs. From the farm, hogs could move to auctions, to local markets or direct to packers. At auctions and local markets, hogs might be purchased by an order buyer, a commission man or a packer buyer. Hogs might be purchased on a live weight or a carcass grade and weight basis.

For each pattern, costs of auctions, local markets, packers (before hogs are slaughtered), and transportation were included. Five patterns were compared under present and modified producer and packer size and location conditions.

In contrast to the Illinois study, this study did not show large cost reductions with larger volume market agencies. In fact, the patterns using the largest auctions and the largest local markets had higher costs than patterns with auctions and local markets of moderate size. Lower per unit costs achieved in the largest market agencies were more than offset by the accompanying increase in transportation costs necessitated by the decline in the number of markets. (Transportation costs were left out of the Illinois study.) The direct-to-packer method was by far the lowest cost method.

These two studies bring out the following points: (a) Costs associated with alternative marketing patterns vary greatly, as do costs of individual firms. (b) Larger firms tend to have lower costs per hog than do small firms of the same type. (c) Farm-to-market transportation costs are an important part of the total costs of marketing hogs. (d) Lower costs are probably the major force behind the trend toward direct marketing.

ALTERNATIVE MARKETING SYSTEMS

Previous sections provide a description of the present Iowa hog-pork marketing system. The primary objective of
this section is to examine some alternatives to the present system.

The diagram in fig. 8 identifies the part of the hog-pork industry that is of interest here. This diagram shows the activities that are performed from the point hog production begins (bottom of the diagram) until pork products reach consumers (top of the diagram). It therefore describes the vertical structure of the hog-pork industry. The boxes show the different types of firms and agencies that perform activities, and the dashed lines separate them into four main categories: production of hogs, the marketing system, consumer demand for pork products, and supply firms. The arrows show the flows of supplies, hogs, and pork products between the various firms and consumers. (Arrows pertaining to supply firms other than feed manufacturers are omitted.) Tables 1 and 2 and fig. 2 presented detailed information for Iowa on the flow of hogs from producers to slaughterers.

The marketing system serves as a link between hog producers and consumers. It must provide for the performance of several physical operations (e.g., transporting, slaughtering, processing, packaging, etc.), and it must provide a means of coordinating the actions of producers and marketing firms with the desires of customers.

The term “coordination” refers to the way in which activities at different levels in the vertical structure in fig. 8 are tied together. The effectiveness or ineffectiveness of coordination has a significant impact on the costs and returns of businesses. A well-coordinated marketing system accomplishes a number of desirable goals. (a) It minimizes the number of unpleasant surprises to participants. For example, suppose a hog slaughtering plant expects receipts of hogs to number 20,000 next week and 25,000 the following week. It will schedule its operations and its use of labor accordingly. If actual receipts turn out to be 30,000 and 20,000, the plant experiences an unpleasant surprise. It will have a shortage of labor and supplies the first week, and an excess the second. Both the shortage and the excess result in higher costs than would be experienced if actual receipts were close to expected receipts. A large deviation of realization from anticipation is frequently an unpleasant surprise. These surprises are fewer in a well-coordinated system than in a poorly coordinated system. (b) A well-coordinated system makes it easier to plan for the future. (c) In a well-coordinated system, a firm that makes available to its customers exactly the quantity and grade of product they want at the time they want it receives a higher price than the firm that fails to do these things, and the products most wanted by customers will return more to producers than will other products. (d) Customers will know which products and grades are more expensive to produce because these will carry higher prices that reflect their higher costs. (e) A well-coordinated system allows an easy flow of information: Information on desires and needs flows from customers to suppliers. Information on costs and availabilities flows from suppliers to customers.

This section focuses on the hog marketing system—that part of fig. 8 connecting producers to slaughterers.

Alternative hog marketing systems fall into two categories according to the way the task of coordinating the actions of hog producers and slaughterers is accomplished. In one category, price-coordinated marketing systems, prices coordinate activity. That is, the arrows connecting producers, marketing agencies, and processors in fig. 8 may be thought of as representing markets in which prices are established. In these systems producers come in contact with buyers only after hogs are produced and ready for slaughter. At that time a price is established and the hogs are transferred to a new owner. The price that is established coordinates activity both by rewarding the producer for his contribution, and by signaling to him any need that may exist for changes in the amount or grade of hogs he produces.

In non-price-coordinated systems, other means of coordination are used to supplement or even replace the pricing system. One of these other means of coordination involves placing two or more of the different stages in the vertical structure of the hog-pork industry under the same ownership. For example, the same firm may own both hog production enterprises and slaughtering facilities (i.e., the arrows in fig. 8 connect different “divisions” of the same firm). This is termed vertical integration. A second means of non-price coordination involves contractual agreements between firms in different stages, e.g., between producers and processors, or between feed companies and producers. When contracts are used, the arrows in fig. 8 may be thought of as representing markets, but the flows of hogs are governed both by prices and by specific contracts between individual buyers and sellers. Several different types of contracts are currently used in the hog-pork industry.

Vertical integration and contracting are the two main means of non-price coordination, but there are others. One is cooperative ownership. Producers, for example, may cooperatively own a slaughtering plant (a special case of vertical integration), or they may form a cooperative to negotiate and administer contracts with private processors. Still another means of achieving coordination involves lender-borrower relationships. For example, a feed company may finance a producer’s feed requirements in return for an interest payment and some control over the amount and quality of the hogs produced.
Figure 8. Flow chart of the vertical structure of the hog-pork industry

A common characteristic of all these forms of non-price coordination should be emphasized: Coordination is achieved through agreements between firms, rather than by prices alone. A primary difference between price-coordinated and non-price-coordinated systems is in the amount of "forward information" available. In the former, the only information anyone has available to use in deciding what plans to make now to guide his future operations is information on past and current conditions, especially past and current prices and outlook information. In non-price-coordinated systems he will also have some forward information about the future; the kind will vary with the system. This forward information, e.g., may consist of a contracted guaranteed price or price differential, or of a specification listing premiums and discounts a hog producer will receive for various grades and weights of hogs and requiring him to market these hogs during a specific week.

In presenting alternative marketing systems we are not recommending, we are not even suggesting, that the present system be replaced with one of these. It is possible that the present system of marketing hogs in Iowa could be improved. We are suggesting that if it could be improved, consideration of these alternatives, and perhaps of others that will be suggested by studying these, will lead to ideas for improvement. Most of these alternative systems have not been thoroughly studied, hence the nature and size of the potential gains and losses from adopting them in Iowa are not known. We will suggest what we perceive to be the main advantages and disadvantages of adopting each system in Iowa. There may be other advantages or disadvantages that are more important than the ones we list. Before deciding to adopt any of these, producers would want more information than is now available on their gains and losses from adoption.

ALTERNATIVE PRICE-COORDINATED MARKETING SYSTEMS

Some of the systems to be discussed here are currently used for hogs in other areas, some are proposed hog marketing systems that are not currently used, and some are proposed systems for other commodities. We will examine two presently used auction marketing systems, pooling arrangements presently used in marketing slaughter hogs, and two proposed systems for eggs involving the use of "committee pricing" and "computerized" negotiations.

Auctions

Only a small percentage of the slaughter hogs marketed in Iowa are sold through auction markets. An alternative marketing system for Iowa might center around a more extensive use of auction selling. Such a system may simply involve an expanded number of, or use of, local auction markets now common to Iowa. Or it may involve the adoption of a teletype auction, or it may involve the establishment of one or more telephone auctions.

The Canadian Teletype Auctions

In three Canadian provinces slaughter hogs are sold by teletype auction systems. The systems used in these three provinces share two distinguishing features. First, hogs are sold using a "Dutch" style auction. That is, the asking price on each lot of hogs sold is started at a relatively high level and then gradually reduced until a bid is entered. The first person to enter a bid is the highest bidder and therefore the buyer. Second, a special system of teletypes that connects the office of the producers' sales agency with the offices of packers is used in conducting the auctions.

All three auctions came into being primarily because producers were dissatisfied with the marketing systems that existed before establishment of the auctions. These systems were quite similar to the marketing system now used in Iowa. Because the Ontario auction was the first to begin operation, we will sketch its history, examine its operation and the grading system used, and point out some apparent advantages and disadvantages of the system.

Legislation. The development of the auctions has been influenced by two types of national legislation governing agricultural marketing in Canada. One provides for agricultural producers' marketing boards, and the other concerns selling methods and the grading of hogs.

In essence, provincial marketing boards are producer-controlled organizations established under provincial legislation with power to control specific marketing operations (32). Depending on provincial legislation, a marketing board may have power to negotiate agreements concerning minimum prices, to specify conditions of sale, or to establish and direct a sales agency with complete authority over the trading of a particular farm product. A provincial marketing board has control only over the product produced within the province, but it can compel producers within that province to adhere to the marketing plan adopted by the board. These marketing boards have played a central role in establishing the teletype auction.

Canadian legislation dealing with methods of grading and selling hogs is discussed more fully in a later section.

History of the Ontario hog auction. At the time this auction began operation in May of 1961, it was the most recent of several efforts by Ontario hog producers to improve their hog marketing system (17, 27, 32).
Before and during the 1940's hog producers in Ontario could sell their hogs using one of three main channels: the terminal market, local dealers, or direct to packing plants. Until about 1930 the terminal market was the most heavily used channel. But after 1930, the proportion of hogs moving through terminal markets declined steadily. By the mid-1940's more than 90 percent were sold direct to packers. (This compares with about 75 percent presently sold this way in Iowa.) Ontario producers were dissatisfied because they felt packers had a bargaining advantage, and because farmers were unable to obtain needed market information. (Packers, too, were dissatisfied with the lack of market information.) This dissatisfaction led producers to take action to improve the marketing system. After a vote among producers the Ontario Hog Producers Marketing Board was established in 1947. (Its name has since been changed to Ontario Pork Producers Marketing Board.)

The Ontario Hog Producers Marketing Board attempted to negotiate minimum prices with packers. This effort broke down in 1951. In 1953 the board established a sales agency by combining five Toronto livestock exchange commission firms. This agency was controlled by the board and had power to establish prices, direct the movement of hogs, and handle sales and payments to producers. This effort also failed, primarily because the relatively small number of hogs moving through the terminal stockyards robbed the agency of needed bargaining power.

In 1955, the board established the Ontario Hog Producers Cooperative as its selling agency. The OHPC established hog assembly yards at several points in the province. The objective was to channel enough of the supply of hogs through these agency-operated marketing yards so that packers would be forced to obtain a significant part of their slaughter hogs through competitive bidding at these yards. The proportion of hogs sold through the OHPC increased steadily until in 1960 it became compulsory for all producers in Ontario to sell their hogs through the OHPC. (At present, sales by producers to local butchers slaughtering less than 50 hogs per week are exempt.)

In 1960, then, the marketing board had accomplished several of its original objectives. However, there were still some unresolved problems, especially with the mechanics of the pricing system used. To overcome these problems representatives of the packers suggested the adoption of a Dutch style auction system using teletypes. Although the producer representatives initially objected to the idea, they later proposed a very similar system which was put into operation in May 1961.

Developments in Manitoba and Alberta. The adoption of a teletype auction in Ontario set the stage for changes in the hog marketing systems in Manitoba and in Alberta. In the early 1960's producers in both provinces were dissatisfied with the then existing marketing systems for many of the same reasons Ontario producers had been dissatisfied.

In Manitoba this dissatisfaction led to the establishment of a teletype auction in February 1965. This system is similar to the one in Ontario, but has two distinct features (16, 50). First, it is controlled by a marketing commission rather than a marketing board. Commission members are appointed by the government, whereas board members are elected by producers, and a commission member need not be a producer but a board member must be. Second, in Manitoba a producer is not compelled to market his hogs through the teletype system; if he submits a written request to the marketing commission he may sell his hogs direct to a packer. All producers must contribute to the cost of operating the teletype system, whether they use it directly or not. Packers must report to the marketing commission each day the number and average price of hogs purchased directly from producers.

A teletype auction system like the Ontario system began operation in Alberta in October 1969 (11).

The Ontario teletype auction: physical facilities and operation. The Ontario system includes about 45 hog assembly yards located throughout major producing regions in the province. These are connected either by teletype or telephone with the office of the Sales Division of the Ontario Pork Producers Marketing Board in Toronto. This office contains a master teletype and an electronic broadcast repeater. The master teletype and broadcast repeater are linked with 13 buying machines located in packer offices. An additional buying machine is located in the Toronto office so that bids can be entered on behalf of smaller packers.

The first step in selling hogs is for the producer to deliver his hogs to one of the assembly yards. Here they are unloaded, weighed, tattooed for carcass identification, and penned into lots containing the number of hogs prescribed by the sales staff; they are not graded. When a lot of hogs is ready for sale, the assembly yard manager notifies the Toronto office.

Before the market opens, the sales staff in the Toronto office must decide, using information about local and other Canadian and U. S. market conditions, what price ranges are to be used in the day's auction. Once this is done the "tapes" to be used are selected. These tapes encompass a one-dollar price range with 5-cent gradations. Many tapes covering various price ranges are on hand, and one must be inserted in the master teletype for each lot of hogs that is sold.
To begin the sale of a lot of hogs, a member of the sales staff hands an “offering slip” to the master teletype operator. The operator types out (a) the date and time, (b) the assembly yard from which the hogs are being offered, (c) the lot number, and (d) the number of hogs in the lot. Then, the appropriate tape is inserted and the prices are typed in descending order.

All the information in (a) through (d) appears simultaneously on all 14 buying machines. These buying machines are simply teletypes with a large black button attached. When a buyer wishes to enter a bid, he presses the button as soon as the price he wishes to offer has been typed.

As soon as a bid is entered, a light on the broadcast repeater in the Toronto office identifies the bidder. The teletype system is immediately stopped, and only the master machine and the buying machine of the successful bidder continue to record. The master machine automatically prints the code of the successful buyer; the latter confirms the sale by typing the letters “OK.” Finally, the sale price, but not the successful buyer’s name, is broadcast to all buying machines. The sale of a lot of hogs will normally take from 30 seconds to one minute. The teletype record of a sale might look as follows:

April 26-72 10:42 BARRIE LOT 21 52 HOGS
30.00 29.95 .90 .85 .80 .75
OK LB
LOT 21-29.75

The system is capable of distinguishing bids entered only 1/1000 of a second apart, so the simultaneous entering of bids is not a problem. If the price declines one dollar to the lowest price on the tape without a bid being entered, the lowest price is typed three times, bells sound on all buying machines, and “No Sale” is printed. The lot may be reoffered later at the discretion of the sales staff. Through selection of tapes, the sales staff may adjust the price ranges used according to composition of the lot, location of the lot, and current market conditions.

Costs of the system are shared by producers and packers. Producers are assessed 1.5% percent of the sale price of hogs sold to cover costs of administration and operation of the marketing yards. Producers must pay transportation costs from the farm to the assembly yard. Packers are assessed a fee on a per head basis to cover costs of the teletype system, and must pay transportation costs from the assembly yards.

In Manitoba and Alberta the selling of lots of hogs is accomplished in an almost identical fashion. However, there are significant differences between these systems and the Ontario system in the methods used to assemble hogs. Only two assembly yards have been established in Manitoba, and neither of these is owned by the Hog Marketing Commission. Many hogs are sold en route from the farm and are not unloaded until they reach the packer. In Alberta the Hog Marketing Board has no jurisdiction over the assembly of hogs. Six delivery points are designated, but the board does not operate marketing yards at these locations. More than 500 hog assemblers at more than 300 locations are licensed by the board, and may collect hogs from producers and offer them for auction. Also, in Alberta a producer’s hogs can be sold while still on his farm, and then moved directly to the slaughtering point. The fees charged producers and packers are 30 cents per hog in both Manitoba and Alberta. In Alberta and Manitoba the producer’s name may be entered on the teletype with the description of his lot of hogs. This allows him the opportunity to differentiate his product.

The Canadian grading system. All hogs in Canada must be purchased on a carcass grade and weight basis. A national grading system specifies grade categories according to backfat and carcass weight. All carcasses are graded at the packing plant by federal graders, and an “index-value” is determined for each carcass (49). This system is illustrated in fig. 9.

The government grader measures backfat at its thickest points at both the loin and shoulder and sums these measurements. Using this sum the appropriate row under the column labeled “backfat inches” is located. Finally, the cell corresponding to this row and the appropriate hot carcass weight column (note that hot carcass weight categories are listed across the top of the table) contains the index value for the carcass. This index is reduced 3 points if the carcass has “type” demerits, and 10 points if the carcass has “quality” demerits. (See explanation below the table in fig. 9.)

To determine the carcass price, this index is multiplied by the sale price at the auction to give the price per hundredweight. Then the price per hundredweight is multiplied by the carcass weight (less trimmable demerits) to arrive at the carcass price. If the carcass has a final index of 103 or higher, the Canadian government pays the producer an additional premium of $3 per hog. The producer receives a settlement form indicating the carcass weight, backfat, index, demerits, and price for each hog sold.

The price a packer bids at the teletype auction is a carcass weight price for an average hog (index = 100); price differentials for different quality hogs are incorporated in the grading system through the value index. At the time he bids on a lot of hogs the packer does not know the grades of the hogs he is bidding on, nor does he know the actual price he will be paying for the lot. Grades are not known
Figure 9. Canadian hog carcass price differential table, in percentages of bid price

<table>
<thead>
<tr>
<th>Backfat Inches^a/</th>
<th>Predicted Yield</th>
<th>90 lb.</th>
<th>125 lb.</th>
<th>130 lb.</th>
<th>140 lb.</th>
<th>150 lb.</th>
<th>160 lb.</th>
<th>170 lb.</th>
<th>181 lb.</th>
<th>196 lb. and Over</th>
<th>Ridgling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>69.7%</td>
<td>87</td>
<td>105</td>
<td>109</td>
<td>110</td>
<td>112</td>
<td>112</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>2.0 - 2.1</td>
<td>69.0%</td>
<td>87</td>
<td>103</td>
<td>107</td>
<td>109</td>
<td>110</td>
<td>112</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>2.2 - 2.3</td>
<td>68.2%</td>
<td>87</td>
<td>102</td>
<td>105</td>
<td>107</td>
<td>109</td>
<td>110</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>2.4 - 2.5</td>
<td>67.5%</td>
<td>87</td>
<td>100</td>
<td>103</td>
<td>105</td>
<td>107</td>
<td>109</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>2.6 - 2.7</td>
<td>66.7%</td>
<td>87</td>
<td>98</td>
<td>102</td>
<td>103</td>
<td>105</td>
<td>107</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>2.8 - 2.9</td>
<td>66.0%</td>
<td>87</td>
<td>97</td>
<td>100</td>
<td>102</td>
<td>103</td>
<td>105</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>3.0 - 3.1</td>
<td>65.2%</td>
<td>87</td>
<td>95</td>
<td>98</td>
<td>100</td>
<td>102</td>
<td>103</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>3.2 - 3.3</td>
<td>64.5%</td>
<td>87</td>
<td>92</td>
<td>97</td>
<td>98</td>
<td>100</td>
<td>102</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>3.4 - 3.5</td>
<td>63.8%</td>
<td>87</td>
<td>88</td>
<td>95</td>
<td>97</td>
<td>98</td>
<td>100</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>3.6 - 3.7</td>
<td>63.0%</td>
<td>87</td>
<td>88</td>
<td>92</td>
<td>95</td>
<td>97</td>
<td>98</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>3.8 - 3.9</td>
<td>62.3%</td>
<td>87</td>
<td>88</td>
<td>88</td>
<td>92</td>
<td>95</td>
<td>97</td>
<td>91</td>
<td>85</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>4.0 - 4.1</td>
<td>61.5%</td>
<td>87</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>92</td>
<td>95</td>
<td>95</td>
<td>87</td>
<td>82</td>
<td>67</td>
</tr>
<tr>
<td>4.2 - 4.3</td>
<td>60.8%</td>
<td>87</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>92</td>
<td>92</td>
<td>87</td>
<td>82</td>
<td>67</td>
</tr>
<tr>
<td>4.4 - +</td>
<td>60.1%</td>
<td>87</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>87</td>
<td>82</td>
<td>67</td>
</tr>
</tbody>
</table>

TYPE DEMERITS - Subnormal Ham, Shoulder, Belly, Length and Roughness - Less 3%.
QUALITY DEMERITS - Abnormal Fat, Colour or Texture - Less 10%.
TRIMMABLE DEMERITS - Actual Weight Reduction from Hot Carcass Weight if of Farm Origin.

Carcass Price = Bid price multiplied by price differential^b/
Carcass Value = Carcass price multiplied by carcass weight^b/

^a/ Sum of backfat measurement opposite first rib plus backfat measurement opposite last lumbar vertebra.

^b/ Example: Suppose bid price is $30 per cwt. and carcass weighs 155 pounds and has backfat measurements of 1.3 inches opposite first rib and 1.7 inches opposite last lumbar vertebra.

Carcass price = $30.00 x 1.02 = $30.60
Carcass value = $30.60 x 1.55 = $47.43

qualities of hogs are legislated rather than determined by 

The system is rigid in that price differentials for different qualities are substantial, amounting to as much as 24 percent.

**Evaluation.** Two studies (16, 18) indicated that the introduction of the teletype auction resulted in a price increase in Manitoba. Estimates of the amount of the increase ranged from 50 cents to $1.50 per hundredweight of carcass, with an average of about 80 cents. When allowances were made for costs of operating the system and when the lowest estimate of the price increase was used, the additional income to producers in Manitoba was estimated to be $330,000 per year. Gains to producers in Ontario, with a much larger volume, were estimated to be $1,200,000 per year. This amounts to a gain of some 40 cents per hog.

It has also been found that prices at the teletype auctions are much more variable than prices negotiated on direct sales to packers (17). This presents a problem in that there is an apparently unjustified inequitable treatment of producers, especially if there are relatively large and apparently random differences in prices for successive lots. Another feature of prices at the teletype auctions is the existence of very definite daily and weekly price patterns. Adequate explanations of these patterns have not yet been offered.

The teletype auction systems in conjunction with compulsory grading provide both a larger amount and a more equal distribution of market information than previous marketing systems used in Canada. This may account, at least in part, for the higher average prices received by farmers.

The Canadian regulations concerning carcass grade and weight selling apply to all marketing systems used in Canada, not just the teletype auctions. However, the teletype auctions could not operate as they now do without these regulations. Since the hogs are sold by description and only one price is determined for each lot, and since hogs are not a uniform product, some method is needed to adjust the sale price to reflect the actual quality of the hogs purchased. In Canada, the grading system handles this task.

Some advantages of this grading system are: (a) Grading is performed on carcasses rather than on live animals, which improves grading accuracy; (b) producers receive substantial premiums and discounts reflecting carcass value differences; and (c) producers receive with their payment detailed information useful for improving production practices. Two disadvantages of the teletype auctions in combination with this grading system are: (a) The system is rigid in that price differentials for different qualities of hogs are legislated rather than determined by the market, and (b) the system makes it very difficult for a packer to specialize in a particular quality of hogs: he has no idea what quality he is buying until after hogs are slaughtered. The first disadvantage might be overcome by allowing the sales division of the marketing board to use available marketing information to set weekly price differentials and to communicate these to all packers and assembly yards. This second disadvantage may be overcome to some extent by including the producer's name with the description of the hogs on the teletype, as is done in Alberta and Manitoba. The problem of undue variability between prices of successive lots might be ameliorated by pooling receipts from successive lots. For example, if one lot of 50 hogs is bought at a bid of $25 per hundred pounds and the next lot of 50 hogs for $23, the pooled bid price for both lots is $24.

Interviews with producers have revealed a generally favorable attitude toward the teletype auctions. These probably stem from the favorable performance of the systems, and from satisfaction producers receive from having control of the marketing system. However, there is some dissatisfaction arising from the loss of freedom brought about by compulsory features of the systems in Ontario and Alberta. This has been a significant problem in Ontario because producer-members of some cooperative packing plants have not been allowed to sell direct to the cooperatives.

A second indicator of producer attitudes is level of use of the systems. Since the systems are compulsory in Ontario and Alberta, one cannot make an evaluation in these provinces. In Manitoba about 60 percent of the hogs are sold through the teletypes. However, a recent study indicates that larger producers in Manitoba tend to prefer direct sales (5).

Third, the rate of adoption of the teletype system must be regarded as an impressive indicator of producer attitudes. In a period of less than 10 years, the percentage of all slaughter hogs marketed in Canada that are sold through teletype auctions has gone from zero to more than 60 percent.

Finally, could a teletype auction system be adopted in Iowa? Two types of legislation not existing in Iowa paved the way for the establishment of the teletype auctions. One of these permits producers to have control over the marketing of hogs. The other provides for mandatory carcass weight and grade selling, as well as a grading system that "automatically" determines price differences for different qualities of hogs. If these regulations or suitable alternatives could be adopted in Iowa, it would appear that teletype auctions could also be adopted. The system appears to be quite flexible in other respects—e.g., assembly.
yards, compulsory participation, and conduct of the
auctions.

**Telephone Auctions**

The telephone auction has been used in Missouri (and
in some other states) for marketing both feeder pigs and
slaughter hogs. The telephone auction is conducted in much
the same manner as an ordinary (ascending price) auction
except that the auctioneer, the hogs or feeder pigs being
offered for sale, and various groups of bidders may all be in
different locations. All the parties to the auction are
brought together using a telephone conference call.

The telephone auction is similar to the Canadian
teletype auctions in some ways. The telephone auction
differs from the teletype auctions in that the former
appears to be most appropriate for smaller scale marketing
operations, it requires less elaborate physical facilities, and
it requires no special legislation to become operative.

The MFA Livestock Association, a farmer cooperative
headquartered in Marshall, Missouri, has operated telephone
auctions for both feeder pigs and slaughter hogs. Discussion
of the feeder pig auctions will be used to illustrate the
operation of a telephone auction.

The telephone auction for feeder pigs is only one part
of the broader feeder pig program sponsored by the MFA
Livestock Association. To participate in the program, a
producer must farrow a minimum of ten sows per year,
follow a supervised breeding, health, and sanitation
program, and agree to market all feeder pigs produced for
sale through the MFA Livestock Association. About 1,250
feeder pig producers participate in the program.

**Operation of the MFA Feeder Pig Telephone Auctions.**
The first telephone auction was held on Dec. 2, 1965, and
at present auctions are held two evenings each week. The
association operates ten assembly yards. On a given sale day
pigs are sold from either two or three of the assembly
yards; and each assembly yard is used only once every 2
weeks.

On the day of a sale producers deliver pigs to the
assembly yards being used that day. The pigs are unloaded,
inspected by a veterinarian, eartagged (to identify the
producer), graded, weighed, and penned into lots of similar
weight and grade. A dual grading system is used. One
grading system distinguishes three levels of genetic ability
(conformation and feed conversion) of the sow herd from
which the pigs were produced. The second grading system
distinguishes two levels of condition of the feeder pigs. In
total, then, there are six grade classifications. Pigs owned by
more than one producer may be penned together in lots of
uniform weight and quality.

Once sorting and penning is completed at all assembly
yards, a master sale order is developed. This lists all lots to
be sold, the order in which they are to be sold, and the
location, predominant breeds, grade, number of head, and
total and average weight of each lot.

In the evening potential buyers assemble at each
designated buying point. There may be as many as 14
buying points located in Missouri and surrounding states.
Each is placed in communication with the auctioneer and
with the other buying points through a conference
telephone hookup. The potential buyers are able to hear
the telephone conversation through a loudspeaker system.
They may enter in the conversation (e.g., to bid) through
the phoneman or “ringman” at the buying point.

The master sale order is posted at each buying point
and explained 30 minutes before the auction begins. The
auction itself is conducted in much the same manner as in
an auction barn. The auctioneer’s voice carries to all bidders
through the loudspeaker systems. To enter a bid a bidder
notifies his “ringman,” who in turn enters the bid. Bidders
can identify competing bidders at the same location, but
not those at other locations.

It usually takes about one minute to sell each lot and
about 30 minutes for the entire auction. The number of
pigs sold at each auction averages slightly less than 3,000.
Annual volume has increased rapidly in recent years, and in
1971 was approximately 416,000 head.

Terms of sale are cash on delivery. Buyers must pay
transportation costs from the assembly yards, a
25-cent-per-head charge for eartagging, and a charge for
vaccination. Producers are charged between $1.25 and
$1.50 per head sold, depending on the average weight of
pigs consigned. The MFA Livestock Association provides a
100 percent “livability” guarantee to buyers for the first 2
days after the sale, and a 98 percent livability guarantee for
the next 8 days.

**MFA Slaughter Hog Telephone Auction.** In March
1968, the MFA Livestock Association began a telephone
auction for slaughter hogs. Slaughter hogs were received at
two assembly yards one day each week, and sold through a
telephone auction the following day. Hogs were identified
by owner, graded, and penned (pooled) into uniform lots.

These auctions were conducted in much the same
manner as the feeder pig auctions, except that each packer
bidder was given a separate phone and identified by number
only in order to preserve anonymity. Producers were
charged 80 cents per head sold, and buyers were charged
12½ cents per hundredweight.
The MFA slaughter hog telephone auction remained in operation for only 15 months. MFA officials cited high costs and competition with MFA-operated local markets as reasons for discontinuing the auctions.

Evaluation. Little analysis of telephone auctions has been undertaken. These auctions increase the amount of, and equalize the distribution of, market information. But little can be said about their effect on the level and variability of prices. The telephone auction overcomes some of the disadvantages associated with decentralized marketing: (a) Through competitive bidding each producer's hogs or feeder pigs are exposed to a large group of potential buyers. (b) Centralized selling on a description basis increases buyer convenience and reduces procurement costs.

The success of the feeder pig auctions indicates a favorable attitude on the part of both buyers and producers and demonstrates that it is possible to conduct a centralized system of sales by description when live grading is required. And, this can be accomplished without extremely elaborate facilities or special legislation giving a producer-controlled agency exclusive control of the marketing system.

On the other hand, slaughter hog telephone auctions have been much less successful (both in Missouri and Wisconsin). The main reason appears to be that packer support of the telephone auction is hard to obtain. This lack of support may arise from the difficulty in developing a live grading system adequate for selling slaughter hogs by description.

Telephone auctions appear to be immediately adaptable to Iowa. The Missouri experience indicates that their operation can be quite advantageous to both producers and purchasers of feeder pigs. However, their potential success in the marketing of slaughter hogs is less clear.

Pooling

Evidence presented in the earlier discussion of price differences indicates that the price an individual producer receives for his hogs is influenced by the size and uniformity of the lot he markets. Typically, the larger and more uniform the lot is, the higher will be the price received. We might expect, then, that smaller producers would receive lower prices for two reasons—first, the lots of hogs they market are both smaller and less uniform, and second, they market hogs less frequently, are less familiar with market conditions, and are therefore in a relatively weak bargaining position.

One marketing practice that both slaughter hog and feeder pig producers have used to overcome these disadvantages is termed “pooling” or “commingling.” Pooling usually involves the following steps. Individual producers deliver livestock to an assembly yard. Here livestock are unloaded, weighed, sorted, and then penned (or pooled) into lots of uniform weight, grade, and other characteristics. Each pen or lot may include livestock owned by several producers, and the livestock delivered by a single producer may be placed in different lots. Finally, the pooled lots are sold, and the producer receives the pooled lot price for the weight of the livestock he has contributed to the pooled lot.

Pooling may be used in combination with almost any type of marketing system except, perhaps, direct sales to packers or dealers. (In the latter case, however, the dealer may engage in pooling.) Pooling is almost always used in conjunction with auction sales. The MFA Livestock Association feeder pig telephone auction uses pooling with an auction sale. Pooling has been used extensively in several parts of the United States, but not in Iowa.

Development of Pooling. Pooling was first used in marketing lambs before 1900. The practice arose because of the failure of the existing marketing system to serve the needs of smaller producers. Slaughter hog pooling became a widely used marketing practice in the 1930's and 40's. Because specialization in feeder pig production is a relatively recent development in the hog industry, so is feeder pig pooling. It was not used to a significant extent before the late 1950's.

The most recent comprehensive study of livestock pooling in the United States was undertaken in 1959 (35). No doubt the situation has changed, but this study gives at least some indication of the present status of pooling. By far the most extensive use of pooling was in the seven states of Missouri, Indiana, Ohio, Pennsylvania, Georgia, Kentucky, and Tennessee, and a few marketing agencies in Iowa were engaged in pooling. Several classes of livestock were pooled. In terms of numbers of animals, slaughter hogs were the most important class and feeder pigs were the least important. There are indications that livestock pooling, and especially feeder pig pooling, has become a more prevalent marketing practice since 1959.

Evaluation. In the 1959 study (35) the major advantage cited by producers, and especially smaller producers, was higher prices for livestock. Pooling, in combination with centralized selling, was effective in overcoming the price disadvantage of smaller producers. A disadvantage noted by producers was that it eliminates or makes very difficult "by-bidding" at auctions, that is, refusal by an individual producer of a bid on the pooled lot.

The most important advantage of pooling to marketing agencies was that it reduced per unit costs. Cost reductions
were found to be due to reduced selling time, a reduced facility requirement, and increased sale volume. Problems encountered by marketing agencies included difficulties in developing grading procedures satisfactory to consignors and buyers, and increased office work.

Advantages to buyers were the availability of large, more uniform lots, a reduction of time and expense associated with buying, and an improvement in the quality of livestock available (perhaps because producers were aware of price differentials for different grades of livestock). Disadvantages to buyers were, of course, higher prices, difficulty encountered in buying small lots, and an increased shrink loss.

In most cases producers, marketing agencies, and buyers indicated that advantages outweighed disadvantages.

It is not known by how much pooling increases prices, or whether higher prices obtained through pooling exceed the additional costs of pooling. It does appear that pooling could be used to advantage in cases where livestock is presently sold through auctions, or other centralized facilities, on a live basis.

Problems that would likely be encountered in attempting to establish successful pooling operations include demonstrating to producers and buyers the advantages of pooling, developing acceptable grading procedures, obtaining and maintaining an adequate sale volume, and developing procedures to control the spread of diseases.

Committee Pricing

Two developments in egg marketing have resulted in much dissatisfaction with the performance of the egg pricing system. In recent years marketing channels and practices have changed considerably. But methods used in determining prices have not changed. In 1966 an extensive study of the present egg marketing system and possible alternatives to that system was undertaken. At least two of the alternatives brought forward are worth consideration as alternatives to the present hog marketing system.

Some of the changes that have taken place and problems that have arisen in hog and egg marketing and pricing systems are similar. At one time most eggs were marketed through terminal markets to wholesalers who, in turn, sold to retailers and institutional buyers. Currently a very high percentage of the eggs marketed move through direct or decentralized marketing channels. Egg marketing channels have decentralized, and a small and declining portion of the eggs marketed move through the terminal markets. Yet prices established at terminal markets are used widely as base prices. There is widespread feeling that these prices are not representative of the qualities and quantities actually traded, and that price changes are much too frequent. Many suspect that prices at the terminal market are subject to manipulation.

These problems have led people to propose alternative egg pricing systems (30). Among alternative systems proposed were a committee pricing system and a computerized exchange system. Both systems have some desirable features. And, it may be possible to model alternative hog pricing systems after them.

Operation. Under a committee pricing system, the committee meets on a regular basis. At each meeting, committee members examine available market information and then decide (by vote) on a suggested current trading price for the commodity. They may suggest several prices—for different grades and regions. Individuals in the industry then can, but are not required to, use this price as a basis for negotiating transactions. The price remains in effect until the next committee meeting. At that meeting the committee may or may not decide to change the suggested price.

A committee egg pricing experiment was conducted from April 1967 to April 1968 (2). A pricing committee was formed and divided into several subcommittees to deal with various grades and regional markets. Committee prices were determined and compared with market prices. Major conclusions were: A committee pricing system is feasible; it would likely result in less price fluctuation and in quotations closer to actual market prices than the terminal quotations currently used as base prices.

This experiment also made it clear that some problems would need to be overcome if a committee pricing system were to become operational. Decisions would need to be made concerning the frequency of committee price quotations (for eggs, one quotation per week was suggested) and the number of committee price quotations (i.e., for different grades and regions). A procedure for obtaining an adequate supply of timely market information would need to be developed. Problems would be encountered in selecting a committee, e.g., selecting individuals who would command the trust of those in the industry. Funds would be required to pay committee members, and to provide for the gathering of market information. A committee pricing system would probably require special legislation.

Evaluation. A committee system has been used for several years in pricing cotton in the United States. The following advantages of a committee pricing system have been cited: It reduces the time and energy devoted to bargaining, it provides more representative base prices, it may lessen fears of price manipulation, it reduces price
eliminate some of the energy and expense devoted to fluctuation, and committee prices may more accurately reflect underlying supply and demand conditions. This last advantage is based on the assumption that the committee would be composed of professionals who have access to a great deal of market information. It might be expected that the introduction of a committee pricing system in hog marketing would reduce the amount of price fluctuation, eliminate some of the energy and expense devoted to negotiations, and lead to a more equal distribution of market information among producers and marketing firms. The problems that would need to be faced in making a committee egg pricing system operational would also have to be faced in making a committee hog pricing system operational. A committee pricing system for hogs would face other difficulties. Hogs are a less homogeneous commodity than eggs. A widely accepted grading system would be needed, and there may be a need for a great many price quotations corresponding to different grades. A committee pricing system is similar to a base pricing system involving terminal market quotations. Historically, a base pricing system has been used in egg marketing, but it has not been widely used in hog marketing. Therefore problems of adjustment by those in the hog industry may be more severe. Finally, it appears that a committee pricing system would need to be adopted at a national, or at least a regional, level.

Computerized Trading

Another egg pricing system suggested was termed an "electronic egg exchange." (31). This proposed system would involve the use of a computer in the price making and exchange process. A computer would play the role of a central market, i.e., traders would communicate and complete transactions by making firm bids and offers through the computer.

Operation. The following description and discussion of an electronic egg exchange illustrates its operation. (This is only one of a number of ways an electronic exchange could be designed.)

The proposed electronic egg exchange would become a part of the wholesale egg marketing system. It would provide for centralized egg pricing. Prices would be determined in much the same manner as they would be if all eggs moved through a central marketplace (i.e., each lot is offered to several buyers, and each buyer has an opportunity to bid on the lots of several sellers). These characteristics of the proposed system are important for two reasons. First, there has been a trend toward lower cost direct marketing of eggs, and this system would permit this trend to continue. Second, the present pricing system, which is regarded with disfavor by many in the industry, would be replaced by one which would appear to have several desirable characteristics. Figure 10 illustrates how the marketing system could be designed. The computer would serve as the central marketplace. Each of the firms in the marketing channel would be connected with the computer, either directly by telephone or teletype, or indirectly through a broker. Negotiations would be conducted, transactions would be completed, and prices would be determined through this communication network. But eggs would be shipped directly from sellers to buyers without going through a central marketplace.

To conduct negotiations and complete transactions, traders would enter offers to buy or sell a specified quantity and grade of eggs for delivery on a specified day, at a specified location, and at a specified price. As each bid or offer is entered, the computer would automatically determine whether or not a transaction is possible, and if so complete the transaction.

For example, if a seller entered an offer, the computer would check to see if a bid for the same grade, delivery date, and delivery place was currently entered that would meet or exceed the seller's offer price. If such a bid was entered, the transaction would be completed at a price halfway between the seller's offer and the buyer's bid, and a quantity equal to the smaller of those specified by the buyer and the seller (unless the quantities are equal) would be traded. The bid or offer of the trader specifying the smaller quantity would then be cancelled. The trader specifying the larger quantity would have the option of continuing or cancelling his bid or offer for the remaining part of his order.

If the computer determined that a transaction was not possible (i.e., a bid meeting or exceeding the seller's offer had not been entered) the seller would be given the option of withdrawing the offer or placing it on file in the computer for active consideration.

To facilitate the completion of transactions in this system, trading would be restricted to forward contracts, quite similar to futures contracts. These contracts would specify the grade of eggs, the delivery point, and the date of delivery. A trader would specify the contract he desires to trade when he enters his bid or offer. At any time, any trader could obtain through the computer the highest current bid to buy, the lowest current offer to sell, and the most recent transaction price for each contract.

The proposed electronic egg exchange provides a market for egg transportation services, as well as for eggs. When entering a bid or offer, each trader would be required to specify delivery points, but he could also specify a schedule of premiums and/or discounts for delivery to other designated locations. Too, egg carriers would be allowed to enter offers to haul eggs between designated points. This procedure would lead to a pricing system for
Figure 10. Example communication channels for the electronic egg exchange

transportation services and would also greatly expand the number of buyers or sellers to which a bid or offer is exposed. Offers to sell or buy at one location become offers to sell or buy at all other locations by adding the lowest current offer to haul to each of the other locations.

Those proposing this system pointed out several problems that would be encountered in implementing it. In order to cover costs of designing and operating the system it may be necessary to form an organization of traders, to allow only members of the organization to trade, and to charge each member a fee for using the system. Since trading would be by description only, an adequate grading system would have to be developed, and some method of policing sellers' compliance with the grade specifications of contracts would have to be devised. Codes would be used to communicate with the computer, and traders may find them difficult to become familiar with. In the early stages of the system's operation there may be "bugs" in the computer programs which would cause annoying delays.

**Evaluation.** Among the potential advantages of an electronic exchange system for hogs are the following: First, hogs would move directly from farms to packing plants by the lowest cost means. At the same time, each producer's hogs would be offered to a large number of potential buyers. Second, because this system has a great deal of flexibility, it is likely that it could be designed to achieve the preceding advantages in a manner acceptable to producers and other industry groups. For example, a number of different qualities of hogs could be traded, and deliveries could be allowed at several different places and on several different dates. Further, prices for each grade-delivery point-delivery date combination would be market determined. The system could be designed so that traders have access to a relatively large amount of market information on an equal basis. Any one of several trading methods could be used, not just an auction. The electronic exchange also could be designed so that a large amount of market information would be distributed on an equal basis to all traders. Iowa producers could adopt such a system regardless of the marketing systems used in other states or regions. And it appears that no special legislation would be required for such a system to be adopted.

In order to realize these advantages, though, some problems would need to be overcome. One important obstacle would be the design and implementation of a grading system that would make selling hogs by description possible. Some method of obtaining funds, probably by assessing producers and packers, would have to be devised. Other difficulties would be encountered in familiarizing traders with the procedures used in communicating through the computer.

Before an electronic exchange system for hogs could be initiated, a considerable number of questions need to be considered. One important question is: Which of the many possible variations of the electronic exchange would be best suited to hog marketing? Answering this question would no doubt require specifying the grades to be traded, the delivery points, the delivery dates, and the trading method to be used. In addition, the impact of alternative ways of designing the electronic exchange on the level and variability of prices is not known. For example, it may be that by choosing the appropriate trading method, price levels could be increased without the extreme variability in prices characteristic of the Dutch auctions.

**Implications for Hog Marketing in Iowa**

This discussion of alternative price-coordinated hog marketing systems and marketing practices has revealed the following points:

First, in the marketing of hogs there is a trend toward shorter, direct, or decentralized marketing channels. This trend appears to be due, at least in part, to the efforts of producers and marketing firms to reduce marketing costs. Changes in the hog pricing system have not kept pace with these changes in marketing channels. As a result producers in many areas have become dissatisfied with the way in which prices are determined, particularly with their weakened bargaining position and with their lack of market information.

Revising marketing practices and (or) revising the marketing system itself would help to overcome these problems faced by producers. One alternative marketing practice that may be especially helpful to smaller Iowa producers is pooling. Other promising alternatives combine decentralized or direct marketing channels with a centralized pricing system. Decentralized marketing channels permit reduced marketing costs, while a centralized pricing system exposes each lot of hogs marketed to a large number of potential buyers and greatly increases the amount of market information available to each trader. These characteristics should make this type of system attractive to producers. The fact that procurement expenses may be reduced in comparison with decentralized pricing systems (e.g., the expense involved in maintaining a staff of livestock buyers in the field would likely be reduced) may make this system attractive to packers as well.

With the aid of modern communication and computer technology, marketing systems that permit centralized pricing to be combined with direct marketing can be designed. Several such systems have already been designed and put into operation—e.g., the Canadian teletype auctions and the MFA telephone auction. And one other system that
would make use of a computer, the electronic egg exchange, has been proposed.

The adoption of an alternative marketing system would not be painless. If a marketing system that involves centralized pricing is adopted, a grading system that would permit selling by description (rather than by inspection) would have to be developed and accepted by producers and packers. Problems may also be encountered in building widespread acceptance and use of an alternative marketing system.

**ALTERNATIVE NON-PRICE-COORDINATED MARKETING SYSTEMS**

The discussion to this point has dealt with alternative price-coordinated marketing systems. Other alternatives fall in the second category, namely, non-price-coordinated marketing systems. Included in this category are a wide range of contracting alternatives as well as vertical integration.

Even though the present hog marketing system is primarily price coordinated, several contracting alternatives are currently available. And, for some producers, these contracts may provide attractive alternatives to present marketing arrangements. Many producers associate contracts and vertical integration with loss of control of their hog enterprises and therefore view the emergence of these alternatives with alarm.

In what follows we will briefly discuss several of the alternative contracting arrangements, and some of the vertically integrated enterprises, that are now a part of the hog marketing system. In addition, an effort will be made to identify forces that motivate the use of contracts and vertical integration, and to identify trends under way in the amounts and types of these arrangements.

**Contracting Alternatives**

Vertical integration is the most extreme form of non-price coordination, since the pricing system is completely replaced and all management decisions are made jointly. In contractual agreements coordination is achieved through a combination of prices and the transfer of management decision-making authority to the contractor. The number and types of management decisions that are transferred depend on the type of contract.

In fig. 11 the major types of contracts presently available to hog producers are classified according to the amount of decision-making authority that is transferred to the contractor. The arrows point in the direction of increasing transfer of decision-making authority away from producers. At the extreme left is the price-coordinated system in which decisions are not made jointly. At the other extreme is vertical integration. The types of contractual agreements range from marketing service contracts, which involve a relatively small departure from a price-coordinated system, to production-management contracts which approach vertical integration. In the upper part of the diagram some of the parties facing producers in the various marketing arrangements are identified. The lower part of the diagram indicates that producers may enter contractual agreements either privately or through cooperatives. Cooperatives also allow producers an opportunity to vertically integrate.

Previous sections have been devoted to alternative price-coordinated marketing systems, the category on the far left in fig. 11. Let us turn now to a more detailed examination of the remaining categories, moving from left to right.

**Marketing Service Contracts**

This type of contract involves an agreement between a producer and a marketing agency under which the marketing agency provides certain marketing services in return for a fee.

These contracts typically allow the producer to choose to market his hogs at one or more terminal markets (perhaps through a specified commission firm), at one or more auctions, or direct to one of several packers. The choice of a market outlet is the producer's responsibility, but at the request of the producer, the marketing agency must: obtain on-farm bids from one or more buyers; advise the producer of current market prices at local, terminal, and auction markets; and inform the producer of trucking rates and probable shrink of hogs shipped to the various outlets. The provisions may also require that the agency guarantee payment for the hogs. The agency, however, does not take title.

The fee charged the producer is usually on a per head basis and comparable with commission charges at terminal markets. Often the contract will require that all slaughter hogs marketed by the producer for the duration of the contract (e.g., 60 days) be marketed through the agency. The marketing agency may be a private firm, an affiliate of a cooperative or a farmer organization, or an agency established by a local producer group.

This type of contract provides the producer the same type of service that a commission firm provides at a terminal market and at about the same cost, but the producer is not required to ship to a terminal market.
Increasing transfer of decision making authority from producer to contracting party

Figure 11. Arrangements for price and non-price coordination in the hog industry
Market-Specification Contracts

These contracts usually involve an agreement between a packer and a group of producers. The contract specifies the number of hogs to be supplied by the producers to the packer, and a set of marketing procedures.

With this type of contract, each producer has full responsibility for decisions concerning his production practices. But the producers as a group agree to provide the packer a specified volume of slaughter hogs during the contract period. The contract usually includes a number of provisions pertaining to marketing procedures: for example, a delivery schedule specifying deliveries by the group to the packer, and deliveries by each individual producer; a delivery point or points; penalties for failure to deliver; premiums for early delivery; assessment of charges to cover costs of administration and facilities, and (or) the agent's fee; and a procedure for determining prices to be paid producers.

The contracting producers may be a locally organized group or a group affiliated with a cooperative or farmer organization. In some cases a cooperative or farmer organization affiliate, or a private firm, serves as an agent, i.e., organizes the producer group, negotiates the contract with the packer, and administers the contract for a fee.

The procedure for determining prices usually requires a number of provisions. The weights and grades of hogs that are deliverable and the method of sale (e.g., live weight, or carcass grade and weight) and a means of identifying the hogs of individual producers must be specified. A procedure for determining a base price must be developed. Daily prices reported at terminal or other markets, or weekly average prices have been used to establish base prices. (If hogs are sold on a carcass basis, it may be necessary to specify a base dressing percent as well.) Other provisions are needed to specify grading procedures, grade premiums and discounts, weight premiums and discounts, deduction for soft carcasses and trim losses, and procedures for allocating condemnation losses. Some contracts also include provisions for a minimum (base) price.

A sample set of provisions for determining prices to be paid producers under a market-specification contract is presented in fig. 12. An example may help to clarify the procedure outlined. Suppose that on the day a contracting producer markets hogs, the packer price for U. S. No. 3, 200-230 lb. hogs is $24.75 per cwt., and the midsession market news quotation (fig. 12–1,B,1,b) is $25 to $26.50 per cwt. The recorded live weight price for the delivery day is then $25 per cwt. If the recorded prices on the four days prior to the delivery day are $26.50, $26.25, $25.75 and $25.25, the base live weight price is $25.75

$$\text{Dividing this price by the base dressing percent, 72.85%, yields the base price of$35.35 per cwt. of carcass.}$$

Now, using the provisions in II, III, and IV of fig. 12, the price for each hog in the lot marketed can be computed. For example, if a hog produces a carcass weighing 176 lbs. (hot weight) with a backfat thickness of 1.4 inches over the last rib, the quality premium is 7 cents per cwt. of carcass and the weight premium is 80 cents per cwt. of carcass. The carcass price including premiums is $36.22 per cwt. ($36.22 = $35.35 + .07 + .80), and the amount the producer receives is $63.75 ($63.75 = 36.22 x 1.76).

Data indicating the percent of slaughter hogs marketed under this type of contract are not available. But these contracts are being used in several states. The contracts used employ a variety of pricing (and other) provisions, some quite different from those in fig. 12.

In terms of the comprehensiveness of the agreement, market-specification contracts go a step beyond marketing service contracts. In most cases, producers having the former are able to receive a price premium due to the guaranteed volume, and have an opportunity to receive an additional premium for high-quality hogs. In return for this they must forgo some flexibility in choosing a market outlet, a selling method, and a marketing date, and they must pay fees to help cover costs of administering the contract.

Forward Pricing Contracts

These contracts are similar to market-specification contracts but with two exceptions: They typically involve a single producer and a packer and, at the time he enters the contract, the producer is guaranteed a specific base price for the hogs he is to deliver to the packer at a later date.

An example forward-pricing contract is presented in fig. 13. The contract specifies the number of hogs to be delivered, a specific base price, and grade and weight requirements for a "base" hog (in this example 200-230 lbs., U. S. No. 1, No. 2 and not more than 10 percent U. S. No. 3). It is common practice to discount hogs not meeting the base requirement, using the schedule of discounts in effect for the packing plant on the day the hogs are delivered. These discounts, then, are not specified at the time the contract is entered. The contract also specifies a delivery point, and a week during which delivery must be made. In the example in fig. 13 provision is made for an advance payment to the producer at the time he enters the contract.
Figure 12. Sample pricing provisions for a market-specification contract

I. Base price.
   A. The base price will be a price per cwt. of hot carcass.
   B. The computation of the base carcass price will involve the following steps.
      1. For each business day (excluding Saturdays) the higher of the following two live weight price quotes will be recorded:
         a. The price paid by the packing company for U. S. No. 3 hogs weighing 200-230 lbs.;
         b. The lower price reported for U. S. No. 1-3, 200-230 lbs. plant-delivered hogs in the USDA market news interior Iowa-southern Minnesota midsession report.
      2. The base live weight price will be computed by averaging the recorded live weight price quotes for the delivery day and the 4 days prior to delivery.
      3. The base carcass price will be computed by dividing the base live weight price by 72.85% (the base dressing percent).

II. Quality premiums and discounts.
   A. Quality premiums and discounts will be based on the thickness of backfat over the last rib of the carcass.
   B. The following schedule of premiums and discounts will be used:
      1. If backfat thickness is 1.6 inches, there will be no premium or discount.
      2. A premium of 3.5 cents per cwt. of carcass will be paid for each one-tenth inch backfat thickness less than 1.6 inches.
      3. A discount of 6 cents per cwt. of carcass will be paid for each one-tenth inch of backfat thickness in excess of 1.6 inches.

III. Weight premiums and discounts.
   A. Premiums and discounts will be based on hot carcass weight.
   B. The following schedule of premiums and discounts will be used.
      1. Carcasses weighing less than 155 lbs. will be discounted 10 cents per cwt. of carcass for each 1 lb. carcass weight falls short of 155 lbs.
      2. Carcasses falling in the 155-175 lb. weight range will command a premium of $1 per cwt. of carcass.
      3. Carcasses weighing 175-180 lbs. will command a premium of 20 cents per cwt. of carcass for each 1 lb. carcass weight falls short of 180 lbs.
      4. Carcasses weighing 180 lbs. will receive no premium or discount.
      5. A discount of 10 cents per cwt. of carcass will be charged for each 1 lb. carcass weight exceeds 180 lbs., up to 190 lbs.
      6. Carcasses weighing more than 190 lbs. will be discounted 20c per cwt. of carcass for each 1 lb. carcass weight exceeds 190 lbs.

IV. Other discounts.
   A. Carcasses weighing less than 140 lbs. will not command quality premiums, but quality discounts will be applied when backfat thickness exceeds 1.6 inches.
   B. Carcasses with inadequate muscling or thin or skimpy bellies will be discounted $2 per cwt. of carcass. Also, quality and weight discounts may be applied but no premiums will be paid.

V. Other pricing provisions.
   A. Condemned hogs will be paid for by the packer if not designated "subject" prior to slaughter. Payment will be based on the average weight and price for the entire lot sold.
   B. Partial condemnation of carcasses will be absorbed by the producer through an appropriate reduction of carcass weight.
AGREEMENT made this_________day of ____________, 19____, between__________

____________________________ of __________________________ (hereafter referred to as Buyer), witnesseth:

1. Seller hereby agrees to sell and deliver, and Buyer hereby agrees to buy and receive approximately_________ head of hogs described and priced as follows:

Barrows and Gilts—weighing 200/230 lbs.—in the usual assortment grading 1's and 3's (not to exceed 10% # 3's) at a price of __________ per cwt. Hogs not meeting weight or grade specifications will be priced in accordance with Buyer's prevailing price differentials in effect at the time of delivery. Buyer's prevailing Merit program in effect at the time of delivery will be applied to hogs delivered hereunder. (Said hogs are, or will be, located at_________ in________________________ County, State of________________________.

2. Said hogs are to be delivered by Seller to Buyer at ________________________________________________ during the week commencing_________________________, 19____, for slaughter to produce meat for human consumption.

3. Subject to prior approval by Buyer's Credit Department, Buyer agrees to pay Seller $5.00 per head forthwith as part payment for said hogs. Buyer agrees to pay Seller the balance of the purchase price for said hogs before the close of the next business day following delivery and determination of the amount of the purchase price.

4. Said hogs are, on the date hereof, subject to a lien or chattel mortgage in the amount of $_____________, in favor of ____________________________. Seller represents and warrants that he will obtain the release of all liens and chattel mortgages on said hogs prior to final payment therefor and will submit proof thereof to Buyer. In the event Seller fails to submit proof of such release, final payment for said hogs will be made jointly to Seller and lien holder.

5. If for any reason whatsoever, delivery of the herein described hogs cannot be made because of sickness, fire, accidents or acts of God, Seller shall accordingly notify Buyer at the earliest possible date.

6. If for any reason whatsoever, delivery of the herein described hogs is not made to Buyer as herein required, all money advanced by Buyer on such undelivered hogs shall be immediately returned and refunded to it in full, without prejudice to such other rights as Buyer may have.

IN WITNESS WHEREOF, the parties have executed this agreement on the date first above written.

__________________________________

Seller

JONES PACKING CO.

__________________________________

By

Buyer
In most cases the packer uses the Chicago futures market to establish his base contract price offer and to reduce his price risk. To establish the base price he uses (1) the prevailing price of live hog futures contracts calling for delivery during, or soon after, the week the producer is to deliver hogs to his plant, and (2) information about the usual relationship between prices in his local area and futures prices. To reduce his risk of losses due to price change (i.e., losses he would incur if local hog prices at the time the producer delivers his hogs are less than the price specified in the forward-pricing contract) he can hedge on the futures market. This would involve selling a live hog futures contract at the same time the forward-pricing contract is entered, and lifting the hedge at the time the hogs are delivered.

Because packers rely heavily on the futures market in administering forward-pricing contracts, grade and weight specifications often correspond closely with those of live-hog futures contracts. In some cases the contract also specifies a number of hogs equal to that called for in a futures contract (currently about 140 head). Too, some contracts specify that the producer must compensate the buyer for any losses in the futures market in the event the producer fails to make delivery.

A number of packers, some in Iowa, currently offer forward-pricing contracts. They are also offered by some marketing agencies (e.g., buying stations).

Forward-pricing contracts offer the producer many of the same provisions as market-specifications contracts. In addition, they offer him a guaranteed base price plus, in some cases, an advance partial payment for his hogs. The producer, in return, must meet a rather rigid delivery schedule, and must pay for the services offered—probably in the form of a reduction in price. Through hedging in the futures market on his own account a producer may be able to reduce price uncertainty, and at a lower cost than he incurs under a forward-pricing contract.

Resource-Providing Contracts

In these contracts the “contractor” (i.e., party contracting with the producer) provides some of the resources needed in producing hogs. An important difference between this type of contract and those discussed previously is that here the contractor becomes involved in the decisions concerning production practices.

The resources provided by the contractor in this type of agreement may include feed, credit, management assistance, assistance in the acquisition of breeding stock and feeder pigs, or others. The producer provides the buildings, equipment, labor, and at least part of the management, and in many cases the breeding stock or feeder pigs and part of the feed. In this type of contract the producer retains ownership of the hogs during the feeding period (although the contract may require that he obtain breeding stock or feeder pigs through the contractor) and assumes production risks.

The contractor may be a packer, a feed company, a breeding stock leasing firm, or a farmer cooperative. A single contractor may coordinate several stages of hog production using this type of contract. For example, he may enter contracts with producers of breeding stock, feeder pig producers, and slaughter hog producers whereby he provides feed and specifies the management program to be used at each stage. It is also possible to combine resource-providing contracts with one of the three types of marketing contracts discussed previously. In this manner, a single contractor could coordinate the breeding, production, marketing, and processing stages.

A great many alternative resource-providing contract arrangements are possible. Several descriptions of arrangements being used have been reported (1, 14, 48). Brief outlines of a sample of these arrangements illustrate the range of alternatives currently available.

One resource-providing contract that has been called the “pig hatchery plan” involves an agreement between the feed dealer and a feeder pig producer. The pig producer supplies breeding stock, buildings, equipment, and labor. The dealer provides feed and some other supplies, and agrees to buy 40-pound feeder pigs from the producer according to a pricing formula set forth in the contract.

Another resource-providing contract involves an agreement between a feed dealer and a producer specializing in growing and finishing slaughter hogs. The feed dealer sells feeder pigs, feed, and supplies to the producer. In addition, he cosigns a bank note to provide financing, dictates certain management practices, and provides a market outlet. The producer owns the hogs while they are on feed, assumes all production risks, and provides the remaining inputs. If the producer defaults on the loan, the dealer is obligated to pay it off and may be able to require the producer to feed another group of hogs. In this contract, as well as in the first one described, the dealer's return is achieved primarily through sales of feed and other supplies.

A type of resource-providing contract which has gained relatively wide acceptance is termed “sow leasing.” The contractor is usually a specialized leasing firm affiliated with a feed company or packer. A typical contract might include the following provisions (13): The leasing company provides the breeding stock (both boars and gilts) and management assistance. The producer agrees to use only leased breeding stock in his operation, to buy feed through
the leasing company (this may not be a requirement), and to pay rent on the leased breeding stock. The rental payments include an initiation fee, a deposit for each animal delivered, a series of payments (e.g., at the time the first, third, and fifth litters are marketed) based on the market value of hogs sold and the number of gilts and boars leased, and a portion of the salvage value of the breeding stock at the end of the contract period. The contract typically remains in effect until from four to seven litters have been marketed. The leasing company may also provide the producer an opportunity to enter a marketing contract.

One researcher (48) has suggested that if the price of hogs is $20 per hundredweight a producer is compensated for the extra cost of sow leasing only if at least one of the following results is achieved: (a) Feed requirements are reduced 16 pounds per 100 pounds of gain, (b) 1/2 extra pig is weaned per litter, (c) price is increased $1.21 per hog marketed, or (d) the number of sows farrowed is increased about 10 percent.

Resource-providing contracts may provide several advantages to producers. Management may be improved, uncertainty regarding profits and losses may be reduced, credit may be made easier to obtain, a lower investment and operating capital requirement per animal unit may allow him to expand his operation, and he may be allowed to specialize in those phases of hog production he is best equipped to handle. The prices the hog producer pays for these advantages are less independence and a lower return per hog.

Production-Management Contracts

The distinction between resource-providing and production-management contracts is not a sharp one. The latter category includes those contracts which essentially place the producer in the position of a salaried employee of the contractor. But it is not always clear when this sort of arrangement does or does not exist. The following are examples of production-management contracts. Both are similar to the custom feeding arrangements used in cattle feeding. The first involves an agreement between a feed dealer and a producer specializing in growing and finishing. The dealer supplies feeder pigs, feed, supplies, a management program, a market for the hogs, and maintains ownership of the pigs. The producer supplies buildings, equipment, and labor, and is paid either a flat fee (based on pounds of gain, possibly adjusted to reward high feed efficiency) or a flat fee plus a share of the profits.

A feeder pig producer might contract the services of a specialized finisher. The finisher provides a "hog motel." The feeder pig producer maintains ownership, assumes all risks, and pays the finisher on a per-hog per-day basis, or on the basis of the pounds gained.

Of the categories of contracts outlined, production-management contracts most nearly approach vertical coordination through ownership (i.e., vertical integration).

Vertical Integration

Vertical integration undertaken by farmer cooperatives and that undertaken by private firms merit separate discussions since the parties and motives are different, as are the impacts on producers.

Through Cooperatives

Farmer-owned cooperatives offer producers an opportunity to own and control a vertically integrated enterprise. Through cooperatives, member producers may gain control over a number of stages in the hog production and marketing process. One of the simplest arrangements involves the negotiation and administration of a market-specification contract by the cooperative for its producer members. This arrangement may, however, be expanded to include a cooperatively owned packing plant, a branded product line, and cooperative ownership of feed mills and other supplies. In fig. 14 a diagram illustrating these vertical coordination possibilities is presented.

Producers organizing a cooperatively controlled vertically integrated enterprise may be able to reduce costs of marketing and (or) processing; to promote stable supplies and prices of hogs; to increase price competition for private processors, retailers, and suppliers; or to provide new services to producer members.

To fully exploit potential gains from farmer-controlled integration through cooperatives, producers would need to agree to a strict program of quality control, and to close coordination of production and processing, perhaps through contractual agreements between member-producers and cooperatively owned processors.

By Farm and Nonfarm Firms

The major motive for vertical integration by private firms probably is increased profits. Vertical integration might contribute to this goal through increased efficiency and lower costs or improved bargaining power.

Feed manufacturing (and perhaps other supply companies), packers, retailers, and even large hog producers may be able to realize these advantages. Certain characteristics of the feed manufacturing industry indicate that pressure for forward integration into hog production is present. For most feed manufacturing firms the greatest opportunity for increased profits is expanded feed sales. Yet the techniques available to a firm wishing to increase
Figure 14. Farmer-controlled integration in hogs through cooperative production and marketing association

feed sales are limited. Increased price competition is not an attractive possibility because it may eventually lead to lower prices and profits; and it is difficult for a single company to gain and maintain an advantage in feed formulation. These difficulties are compounded by the possibility of large hog producers integrating into feed manufacturing.

Interviews with feed company executives have indicated that contracts have been offered by feed companies primarily to increase feed sales. A company may be able to further expand its market for feed through integration. However, to date integration into hog production has not taken place to a significant extent. Some of the reasons appear to be the large investment requirement and the relatively high risk and low returns in hog production compared to other investment opportunities.

Packers, too, face conditions which might lead them toward increased coordination with production, either through contracting or vertical integration. In recent years a shift in bargaining strength from packers to retailers has occurred. One result has been an increased cost consciousness on the part of the packers. Among the possibilities for reducing costs are a stricter volume control (periods of low volume result in high unit costs), better quality control, and a reduction in procurement costs. Closer coordination with hog production may help in these areas.

These forces have probably been at least partly responsible for packer interest in contracting. However, contracting has not become extensive yet. Several Corn Belt packers have resisted contracts, arguing that costs associated with offering them outweigh advantages to the packer. Backward integration by packers into hog production has been practically nonexistent. Even though it might appear that a flexible reserve of packer-owned slaughter hogs could be used to smooth irregularities in purchased supplies, in recent years less than ½ of 1 percent of hogs slaughtered have come from feeding operations of packers. (This compares with national averages of 5.6 percent and 13.3 percent for cattle and sheep, respectively, in 1970.) (44)

Some of the reasons for the lack of vertical integration appear to be the large investment requirements, relatively high risk and low returns, and the belief that owned slaughter animals may add to, rather than eliminate, volume control problems. Forward integration by packers to the retail level, too, has been almost nonexistent.

Of the groups of potential integrators mentioned above, retailers have probably been the least aggressive. A small amount of backward integration by retailers into slaughtering has occurred, but almost none has been carried to the level of hog production. A primary need of retailers is a dependable supply of uniform quality pork. Through use of specification buying on an "offer and acceptance" basis, retailers have been able to fulfill this need and have expressed little interest in integrating.

Large-scale hog production is a very new and largely untested development. But if it succeeds, some highly integrated enterprises may result. Within the past 2 to 3 years hog production enterprises with annual volumes of up to 100,000 slaughter hogs have gone into operation outside the Corn Belt. Some of these operations have already integrated forward into slaughtering with the intention of developing branded products for sale locally or in national chains. For these operations to succeed, problems of disease control, financing, and acquisition of labor must be overcome. The verdict is not yet in.

Non-Price Coordination: Prospects for the Future

The discussion so far has been primarily concerned with a description of the arrangements involving non-price coordination presently used in the hog industry. Let us now attempt to anticipate the future. What changes should be expected? One might draw on developments in the broiler industry for some clues.

In the early 1950's some loose contractual agreements between producers and growers came into use. These informal contracts gradually gave way to more comprehensive and more formal contracts. By 1965, the typical broiler grower no longer assumed the risks commonly assumed by agricultural producers. He was, in effect, a wage earner. More recently some of these contracts have been replaced by vertical integration.

Table 11 shows estimates of the relative importance of vertical integration and contracting in several agricultural industries in 1960 and in 1970. Another recent study (12) indicates that a slightly larger proportion of hogs, 6-7 percent, are produced and marketed under these arrangements. Is it reasonable to expect that this proportion will increase to nearly 100 percent as has been the case in the broiler industry?

A study undertaken at the University of Minnesota (7) attempted to answer this question. The approach was to first try to identify forces underlying extensive vertical integration. It was suggested that an initiating force is rapid technological progress in the industry. If this progress makes possible large-scale, specialized, cost-reducing production units; if farm operators are unable to provide the financing and management required to exploit this technology, and if nonfarm firms are willing to provide the needed capital and management, vertical integration will
Table 11. Contracting and Vertical Integration in Agricultural Industries, 1960 and 1970

<table>
<thead>
<tr>
<th>Item</th>
<th>Share of production under contracts Percent</th>
<th>Vertical integration Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crops:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Dry beans and peas</td>
<td>35</td>
<td>2</td>
</tr>
<tr>
<td>Feed grains</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Food grains</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Fruits and nuts:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrus</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>Other</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Hay and forage</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Oil-bearing crops</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Potatoes</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>Seed crops</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Sugar crops:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td>Cane</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Vegetables:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh market</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Processing</td>
<td>67</td>
<td>85</td>
</tr>
<tr>
<td>Total crops</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Livestock:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broilers</td>
<td>93</td>
<td>90</td>
</tr>
<tr>
<td>Eggs</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Fed cattle</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Hogs</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Milk:</td>
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<td></td>
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<tr>
<td>Fluid</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Sheep and lambs</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Turkeys</td>
<td>30</td>
<td>42</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total livestock</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Total farm output (crop and livestock combined)</td>
<td>15</td>
<td>17</td>
</tr>
</tbody>
</table>

1 Estimates based on the informal judgements of production and marketing specialists within USDA. Precise and certain data on the extent of various forms of coordination do not exist for many commodities.

2 Dashes indicate less than 1 percent.

likely become extensive. These conditions were met in the broiler industry during the 1950's.

The study went on to consider another question: Are these conditions present in the hog industry? The conclusion in 1965 was that although there had been technological gains in hog production, they had not made possible large-scale specialized hog production with cost advantages over operations suited to family-sized Corn Belt farms. In fact, the study found that disease and other management problems might be expected to result in cost disadvantages for these large enterprises. The study went on to state that even if these advances were to become available, there would likely be a strong incentive for vertical integration only if producers were unable to provide the needed financing and management skills.

This conclusion, although significant, should perhaps be accepted with a certain amount of caution. In fact, if the recently established large-scale enterprises with volumes of up to 100,000 hogs prove successful, this will furnish some incentive for vertical integration. Even without technological breakthroughs, contractual arrangements may grow in importance. They offer advantages to packers through volume and quality control; to feed manufacturers through increased feed sales; and to producers through reduced risk, financing which may be otherwise unavailable, an opportunity to receive premiums for consistent volume and quality, and management assistance. And, these advantages may become more pronounced as hog production enterprises become larger.

Other potential developments may encourage the use of contractual arrangements. The separation of feeder pig production and hog finishing could lead to profit-sharing contracts involving the two types of producers. An increased emphasis on pork quality by retailers may lead to more non-price coordination between retailers, packers, and producers.

At the present time the hog marketing system is primarily a price-coordinated one, and it appears that it will remain so for at least the immediate future. However, some contractual arrangements are presently available, and it is expected that because they offer advantages to the parties involved, they will continue to be available. Possibly the present pricing system could be improved, at least from the viewpoint of producers, by adopting an alternative that combines centralized price making and decentralized or direct movement of hogs.

Looking beyond the near future, it is not yet clear whether vertical integration will become more widespread. Most Iowa producers would not consider the prospect of extensive vertical integration by nonfarm firms to be attractive. However, if the choice is between a pricing system and a marketing system involving extensive use of contracts, more study is needed to determine which might have more favorable impacts on producers.


32. Select Comm. of the Legislative Assembly of Manitoba appointed to inquire into all phases of livestock marketing in Manitoba. Livestock Marketing in Manitoba, 1964.


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